

# Title 51 WAC

## COMMUNITY, TRADE, AND ECONOMIC DEVELOPMENT, DEPARTMENT OF (BUILDING CODE COUNCIL)

<b>Chapters</b>			
<b>51-04</b>	<b>Policies and procedures for consideration of statewide and local amendments to the State Building Code.</b>	51-12-102	Section 102. Scope. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-102, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-20-024 (Resolution No. 86-17), § 51-12-102, filed 9/23/86; 86-11-013 (Order 86-04), § 51-12-102, filed 5/13/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-102, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
<b>51-06</b>	<b>Public records.</b>		
<b>51-08</b>	<b>Uniform procedural rules.</b>		
<b>51-11</b>	<b>Washington State Energy Code 2006 edition.</b>		
<b>51-13</b>	<b>Ventilation and indoor air quality 2006 edition.</b>	51-12-103	Section 103. Conflicts with other codes. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-103, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
<b>51-16</b>	<b>State Building Code Guidelines.</b>		
<b>51-19</b>	<b>Washington State Historic Building Code.</b>		
<b>51-50</b>	<b>State Building Code adoption and amendment of the 2006 edition of the International Building Code.</b>	51-12-104	Section 104. Materials and equipment. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-104, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
<b>51-51</b>	<b>State Building Code adoption and amendment of the 2006 edition of the International Residential Code.</b>	51-12-105	Section 105. Alternate materials—Method of construction, design or insulating systems. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-105, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
<b>51-52</b>	<b>State Building Code adoption and amendment of the 2006 edition of the International Mechanical Code.</b>		
<b>51-54</b>	<b>State Building Code adoption and amendment of the 2006 edition of the International Fire Code.</b>	51-12-106	Section 106. Plans and specifications. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-106, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
<b>51-56</b>	<b>State Building Code adoption and amendment of the 2006 edition of the Uniform Plumbing Code.</b>	51-12-107	Section 107. Inspections and enforcement. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-107, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
<b>51-57</b>	<b>State Building Code adoption and amendment of Appendix A, B and Appendix I of the 2003 edition of the Uniform Plumbing Code.</b>	51-12-108	Section 108. Severability. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-108, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
<b>DISPOSITION OF CHAPTERS FORMERLY CODIFIED IN THIS TITLE</b>			
	<b>Chapter 51-10 BARRIER-FREE FACILITIES</b>	51-12-109	Section 109. Violations. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-109, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-10	Barrier-free facilities [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW and 1989 c 266. 90-02-110, filed 1/3/90, effective 7/1/90. Statutory Authority: Chapters 19.27 and 70.92 RCW. 88-24-021 (Order 88-09), filed 12/2/88, effective 7/1/89; 86-24-040 (Order 86-18), filed 11/26/86, effective 4/27/87; 85-07-036 (Order 85-02), filed 3/18/85; 85-03-095 (Order 85-01), filed 1/22/85; 83-15-033 (Order 83-4), filed 7/18/83; Order 77-02, filed 8/3/77; Order 76-02, filed 9/1/76; Order 76-01, filed 6/28/76.] Repealed by 92-01-130, filed 12/19/91, effective 7/1/92. Statutory Authority: Chapters 70.92 and 19.27 RCW.	51-12-110	Section 110. Liability. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-110, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
	<b>Chapter 51-12 WASHINGTON STATE ENERGY CODE</b>	51-12-200	Section 200. General. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-200, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-100	Section 100. Title. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-100, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-201	Section 201. A. [Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-20-024 (Resolution No. 86-17), § 51-12-201, filed 9/23/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-201, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-101	Section 101. Intent. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-101, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-202	Section 202. B. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-202, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
		51-12-203	Section 203. C. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-203, filed 11/26/85.]

	Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.		Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-204	Section 204. D. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-204, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-222	Section 222. V. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-222, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-205	Section 205. E. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-205, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-223	Section 223. W X Y Z. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-223, filed 1/31/89, effective 7/1/89. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-223, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-206	Section 206. F. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-206, filed 1/31/89, effective 7/1/89. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-206, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-300	Section 300. General. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-300, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-207	Section 207. G. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-207, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-301	Section 301. Heated and cooled buildings. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-301, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-208	Section 208. H. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-208, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-302	Section 302. Climatic Zones. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-302, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-209	Section 209. I. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-209, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-303	Section 303. Departures. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-303, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-210	Section 210. J. (Reserved). [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-210, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-304	Section 304. Design parameters. [Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-20-024 (Resolution No. 86-17), § 51-12-304, filed 9/23/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-304, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-211	Section 211. K. (Reserved). [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-211, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-305	Section 305. Ventilation. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-305, filed 1/31/89, effective 7/1/89. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-305, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-212	Section 212. L. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-212, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-400	Section 400. General. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-400, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-213	Section 213. M. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-213, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-401	Section 401. (Reserved). [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-401, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-214	Section 214. N. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-214, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-402	Section 402. Overall thermal performance and building envelope requirements. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-402, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-20-024 (Resolution No. 86-17), § 51-12-402, filed 9/23/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-402, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-215	Section 215. O. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-215, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-403	Section 403. Thermal performance criteria and envelope requirements for low-rise residential buildings. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-12-403, filed 1/3/90, effective 7/1/90. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-403, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-216	Section 216. P. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-216, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-404	Section 404. Thermal performance criteria for all other occupancies. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-12-404, filed 1/3/90, effective 7/1/90. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-11-013 (Order 86-04), § 51-12-404, filed 5/13/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-404, filed 11/26/85.] Repealed
51-12-217	Section 217. Q. (Reserved). [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-217, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.		
51-12-218	Section 218. R. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-218, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.		
51-12-219	Section 219. S. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-219, filed 1/31/89, effective 7/1/89. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-219, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.		
51-12-220	Section 220. T. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-12-220, filed 1/3/90, effective 7/1/90. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-220, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.		
51-12-221	Section 221. U. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-221, filed 11/26/85.]		

	by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-420	Section 420. Water heaters, storage tanks, boilers, and piping. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-420, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-405	Section 405. Air leakage for all buildings. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-405, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-421	Section 421. Pump operation. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-421, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-406	Section 406. Building mechanical systems. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-406, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-422	Section 422. Pipe insulation. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-422, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-407	Section 407. Calculations of heating and cooling loads and system sizing limits. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-407, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-423	Section 423. Conservation of hot water. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-423, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-408	Section 408. (Reserved). [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-408, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-424	Section 424. Electrical power and lighting. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-424, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-409	Section 409. Simultaneous heating and cooling. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-409, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-425	Section 425. Lighting switching. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-425, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-410	Section 410. Energy recovery. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-410, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-426	Section 426. Lighting power budget. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266, 90-02-110, § 51-12-426, filed 1/3/90, effective 7/1/90. Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020, 89-04-043 (Order 88-10), § 51-12-426, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW, 86-11-013 (Order 86-04), § 51-12-411, filed 5/13/86. Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-411, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-411	Section 411. HVAC equipment performance requirements. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020, 89-04-043 (Order 88-10), § 51-12-411, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW, 86-11-013 (Order 86-04), § 51-12-411, filed 5/13/86. Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-411, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-500	Section 500. General. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-500, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-412	Section 412. Energy for air delivery. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-412, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-501	Section 501. Energy analysis. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-501, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-413	Section 413. Balancing. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-413, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-502	Section 502. Design. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-502, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-414	Section 414. Cooling with outdoor air (economizer cycle). [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-414, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-503	Section 503. Analysis procedure. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020, 89-04-043 (Order 88-10), § 51-12-503, filed 1/31/89, effective 7/1/89. Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-503, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-415	Section 415. Controls. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-415, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-504	Section 504. Calculation procedure. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-504, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-416	Section 416. Air handling duct system insulation. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-416, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-505	Section 505. Documentation. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-505, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-417	Section 417. Duct construction. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-417, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-506	Section 506. Buildings utilizing nondepletable energy. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-506, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-418	Section 418. Piping insulation. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-418, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-12-507	Section 507. Documentation—buildings using nondepletable energy sources. [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-507, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
51-12-419	Section 419. (Reserved). [Statutory Authority: 1985 c 144, 85-24-028 (Order 85-14), § 51-12-419, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.		

51-12-600	Section 600. General. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-600, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.		
51-12-601	Section 601. Low-rise residential building envelope requirements. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-12-601, filed 1/3/90, effective 7/1/90. Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-601, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-20-024 (Resolution No. 86-17), § 51-12-601, filed 9/23/86; 86-11-013 (Order 86-04), § 51-12-601, filed 5/13/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-601, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-18-030	Water efficiency standards. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-18-030, filed 1/3/90, effective 7/1/90.] Repealed by 92-01-068, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.170 and chapter 19.27 RCW.
51-12-602	Section 602. Low-rise residential building mechanical systems. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-602, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-11-013 (Order 86-04), § 51-12-602, filed 5/13/86; 85-24-028 (Order 85-14), § 51-12-602, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-18-040	Exceptions. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-18-040, filed 1/3/90, effective 7/1/90.] Repealed by 92-01-068, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.170 and chapter 19.27 RCW.
51-12-603	Section 603. Low-rise residential building service water heating. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-603, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-18-050	Implementation. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-18-050, filed 1/3/90, effective 7/1/90.] Repealed by 92-01-068, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.170 and chapter 19.27 RCW.
51-12-604	Section 604. Low-rise residential building electrical power and lighting. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-604, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	<b>Chapter 51-20</b> <b>STATE BUILDING CODE ADOPTION AND AMENDMENT OF</b> <b>THE 1991 EDITION OF THE UNIFORM BUILDING CODE</b> <b>(Replaced by chapter 51-30 WAC)</b>	
51-12-605	Section 605. Building envelope requirements for other than low-rise residential buildings. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-605, filed 1/31/89, effective 7/1/89. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-605, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.		
51-12-606	Section 606. Building mechanical systems requirements for other than low-rise residential buildings. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-606, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-20-001	Authority. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-001, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-12-607	Section 607. Service water heating requirement for other than low-rise residential buildings. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-607, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-20-002	Purpose. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-002, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-12-608	Section 608. Electrical power and lighting requirements for other than low-rise residential buildings. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-12-608, filed 1/3/90, effective 7/1/90. Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-608, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-11-013 (Order 86-04), § 51-12-608, filed 5/13/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-608, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.	51-20-003	Uniform Building Code. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-003, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
		51-20-004	Conflicts with Washington State Ventilation and Indoor Air Quality Code. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-004, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
		51-20-005	Uniform Building Code requirements for barrier-free accessibility. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-005, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
		51-20-007	Exceptions. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-007, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
		51-20-008	Implementation. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-008, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
		51-20-009	Recyclable materials and solid waste storage. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-009, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
		51-20-0100	Chapter 1. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0100, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
		51-20-0104	Application to existing buildings and structures. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0104, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
		51-20-0300	Chapter 3. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0300, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95.

**Chapter 51-18**  
**WASHINGTON STATE WATER CONSERVATION**  
**PERFORMANCE STANDARDS**

51-18-010	Declaration of purpose. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-18-010, filed 1/3/90, effective 7/1/90.] Repealed by 92-01-068, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.170 and chapter 19.27 RCW.
51-18-020	Application. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-18-020, filed 1/3/90, effective 7/1/90.] Repealed by



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	RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.		Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1224	Construction, height and allowable area. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1224, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-20-2312	Definitions for wind design. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-2312, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1225	Location on property. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1225, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-20-2700	Chapter 27. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-2700, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1226	Exits and emergency escapes. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1226, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-20-2710	Steel structures resisting forces induced by earthquake motions in Seismic Zones Nos. 3 and 4. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-2710, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1227	Light, ventilation and sanitation. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1227, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-20-3000	Chapter 30—Veneer. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3000, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1228	Yards and courts. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1228, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-20-3007	Plastic veneer. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3007, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1229	Room dimensions. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1229, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-20-3100	Chapter 31—Accessibility. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3100, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1230	Section 1230. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1230, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-20-3101	Scope. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3101, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1231	Shaft enclosures. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1231, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-20-3102	Definitions. [Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3102, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3102, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1232	Fire alarm systems. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1232, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-20-3103	Building accessibility. [Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3103, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3103, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1233	Heating. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1233, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-20-3104	Egress and areas for evacuation assistance. [Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3104, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3104, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1234	Special hazards. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1234, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-20-3105	Facility accessibility. [Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3105, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3105, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1800	Chapter 18. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1800, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-20-3106	Section 3106. [Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3106, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3106, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-1807	Special provisions for Group B, Division 2 office buildings and Group R, Division 1 Occupancies. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1807, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.		
51-20-2300	General design requirements. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-2300, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory		

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	5105, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.		
51-20-5400	Chapter 54. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-5400, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27-074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-21-008	effective 6/30/95. Statutory Authority: RCW 19.27-074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-5401	Scope. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-5401, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-21-31010	UBC Standards No. 31-1. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-31010, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-93100	Appendix chapter 31. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93100, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-21-38030	UBC Standards No. 38-3. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-38030, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-93115	Section 3115. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93115, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27-074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-21-38038	Table 1-5.1. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-38038, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27-074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-93116	Section 3116. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93116, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-21-38039	Table 1-5.5. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-38039, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27-074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-93117	Section 3117. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93117, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	<b>Chapter 51-22</b> <b>STATE BUILDING CODE ADOPTION AND AMENDMENT OF</b> <b>THE 1991 EDITION OF THE UNIFORM MECHANICAL CODE</b> <b>(Replaced by chapter 51-32 WAC)</b>	
51-20-93118	Section 3118. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93118, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27-074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-22-001	Authority. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-001, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-93119	Section 3119. [Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-93119, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93119, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-22-002	Purpose. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-002, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-20-93120	Section 3120. [Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-93120, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93120, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-22-003	Uniform Mechanical Code. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-003, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
	<b>Chapter 51-21</b> <b>STATE BUILDING CODE ADOPTION AND AMENDMENT OF</b> <b>THE 1991 EDITION OF THE UNIFORM BUILDING CODE</b> <b>STANDARDS</b> <b>(Replaced by chapter 51-30 WAC)</b>	51-22-004	Conflict between Uniform Mechanical Code and State Energy Code chapter 51-11 WAC. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-004, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-21-001	Authority. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-001, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27-074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-22-005	Conflict between Uniform Mechanical Code and State Ventilation and Indoor Air Quality Code chapter 51-13 WAC. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-005, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-21-002	Purpose. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-002, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27-074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-22-007	Exceptions. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-007, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-21-003	Uniform Building Code standards. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-003, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-22-008	Implementation. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-008, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-
51-21-007	Exceptions. [Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-007, filed 12/19/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95,		

	107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-22-1508	Refrigeration machinery room ventilation. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1508, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-22-0400	Chapter 4—Definitions and abbreviations. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-0400, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-22-1900	Chapter 19—Miscellaneous heat-producing appliances. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1900, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-22-0423	U. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-0423, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-22-1903	Clothes dryers. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1903, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-22-0500	Chapter 5—Equipment—General. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-0500, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	<b>Chapter 51-24</b> <b>STATE BUILDING CODE ADOPTION AND AMENDMENT OF</b> <b>THE 1991 EDITION OF THE UNIFORM FIRE CODE</b> <b>(Replaced by chapter 51-34 WAC)</b>	
51-22-0504	Installation. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-0504, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.		
51-22-0800	Chapter 8—Vented decorative appliances, floor furnaces, vented wall furnaces, unit heaters and room heaters. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-0800, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-001	Authority. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-001, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-22-0807	Room heaters. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-0807, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-002	Purpose. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-002, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-22-1000	Chapter 10—Ducts. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1000, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-003	Uniform Fire Code. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-003, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-22-1002	Material. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1002, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-007	Exceptions. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-007, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-22-1100	Chapter 11—Ventilation systems and product-conveying systems. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1100, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-008	Implementation. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-008, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-22-1104	Environmental air ducts. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1104, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-04000	Article 4. Permits. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-04000, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-22-1500	Chapter 15—Mechanical refrigerating equipment. [Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1500, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-04123	Table No. 4.108-C, Permit amounts for hazardous materials. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-04123, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
		51-24-09000	Article 9. Definitions and abbreviations. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-09000, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
		51-24-09105	Section 9.105. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-09105, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.

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51-24-09107	Section 9.107. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-09107, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-79603	Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW. Corrosion protection. Section 79.603. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-79603, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-09110	Section 9.110. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-09110, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-79809	Unloading operations. Sec. 79.809. [Statutory Authority: RCW 19.27.074, 93-01-163, § 51-24-79809, filed 12/23/92, effective 7/1/93.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-09117	Section 9.117. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-09117, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-79901	General. Section 79.901. [Statutory Authority: RCW 19.27.074, 93-01-163, § 51-24-79901, filed 12/23/92, effective 7/1/93.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-10000	Article 10. Fire protection. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-10000, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-80000	Article 80. Hazardous materials. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80000, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-10201	Section 10.201. General. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-10201, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-80101	Scope. Section 80.101. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80101, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-10507	Required installations of automatic fire-extinguishing systems. Section 10.507. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-10507, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-80103	Permits. Section 80.103. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80103, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-25000	Article 25. Places of assembly. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-25000, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-80108	Construction requirements. Section 80.108. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80108, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-25107	Aisles. Section 25.107. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-25107, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-80109	Personnel training and written procedures. Section 80.109. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80109, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-45000	Article 45. Application of flammable finishes. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-45000, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-80110	Section 80.110. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80110, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-45211	Drying apparatus. Section 45.211. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-45211, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-80111	Section 80.111. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80111, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-78000	Article 78. [Statutory Authority: Chapter 19.27 RCW. 93-01-162, § 51-24-78000, filed 12/23/92, effective 7/1/93.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-80113	Section 80.113. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80113, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-78201	General. [Statutory Authority: Chapter 19.27 RCW. 93-01-162, § 51-24-78201, filed 12/23/92, effective 7/1/93.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-80114	Section 80.114. Section 80.114. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80114, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-79000	Article 79. Flammable and combustible liquids. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-79000, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.	51-24-80120	Table No. 80.112-A. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80120, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
51-24-79601	General. Section 79.601. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-79601, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95.	51-24-80202	Hazard categories. Section 80.202. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80202, filed 12/13/91, effective 7/1/92.]

- 51-24-80301 tive 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
- 51-24-80303 General. Section 80.301. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80301, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
- 51-24-80305 Toxic and highly toxic compressed gases. Section 80.303. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80303, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
- 51-24-80315 Flammable solids and combustible dusts. Section 80.305. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80305, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
- 51-24-80315 Delete section 80.315 Carcinogens, irritants, sensitizers and other health hazard solids, liquids and gases entirely. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80315, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
- 51-24-80401 Section 80.401. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80401, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
- 51-24-80402 Dispensing and use. Section 80.402. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80402, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
- 51-24-99500 Division V. Standards. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-99500, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
- 51-24-99510 Appendix V-A. Nationally recognized standards of good practice. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-99510, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.

#### Chapter 51-25

#### STATE BUILDING CODE ADOPTION OF THE 1991 EDITION OF THE UNIFORM FIRE CODE STANDARDS (Replaced by chapter 51-35 WAC)

- 51-25-001 Authority. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-25-001, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
- 51-25-002 Purpose. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-25-002, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
- 51-25-003 Uniform Fire Code standards. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-25-003, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.
- 51-25-007 Exceptions. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-25-007, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory

Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.

Implementation. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-25-008, filed 12/13/91, effective 7/1/92.] Repealed by 95-11-107, filed 5/23/95, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.020, 19.27.031 and chapter 34.05 RCW.

#### Chapter 51-26

#### STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 1991 EDITION OF THE UNIFORM PLUMBING CODE (Replaced by chapter 51-46 WAC)

- 51-26-001 Authority. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-001, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-26-002 Purpose. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-002, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-26-003 Uniform Plumbing Code. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-003, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-26-004 Exceptions. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-004, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-26-008 Implementation. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-008, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-26-0300 Chapter 3—General instructions and regulations. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0300, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-26-0310 Prohibited fittings and practices. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0310, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-26-0315 Protection of piping, materials, and structures. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0315, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-26-0400 Chapter 4—Drainage systems. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0400, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-26-0401 Materials. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0401, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-26-0500 Chapter 5—Vents and venting. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0500, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-26-0503 Materials. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0503, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-26-0909 Section 909—Floor drains and shower stalls. [Statutory Authority: Chapter 19.27 RCW. 95-01-124, § 51-26-0909, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.



51-26-1000	Chapter 10—Water distribution. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1000, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.		Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-26-1004	Materials. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1004, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-26-1830	Accepted plumbing fixtures and fixture fittings. [Statutory Authority: Chapter 19.27 RCW. 95-01-124, § 51-26-1830, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1830, filed 12/23/92, effective 7/1/93.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-26-1007	Section 1007—Water pressure, pressure regulators, and pressure relief valves. [Statutory Authority: Chapter 19.27 RCW. 95-01-124, § 51-26-1007, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-26-1840	Implementation. [Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1840, filed 12/23/92, effective 7/1/93.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-26-1009	Section 1009—Size of potable water piping. [Statutory Authority: Chapter 19.27 RCW. 95-01-124, § 51-26-1009, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-26-1845	Amendments. [Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1845, filed 12/23/92, effective 7/1/93.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-26-1020	Section 1020—Table 10-1. [Statutory Authority: Chapter 19.27 RCW. 95-01-124, § 51-26-1020, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-26-2200	Chapter 22—Minimum plumbing facilities. [Statutory Authority: Chapter 19.27 RCW. 95-01-124, § 51-26-2200, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-2200, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-26-1301	General. [Statutory Authority: Chapter 19.27 RCW. 95-01-124, § 51-26-1301, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-26-2300	Chapter 23—Rainwater systems. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-2300, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-26-1800	Chapter 18—Water conservation performance standards. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1800, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-26-2301	D1 materials. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-2301, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-26-1801	Declaration of purpose. [Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1801, filed 12/23/92, effective 7/1/93. Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1801, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	<p style="text-align: center;"><b>Chapter 51-27</b>  <b>STATE BUILDING CODE ADOPTION OF THE 1991 EDITION OF</b>  <b>THE UNIFORM PLUMBING CODE STANDARDS</b>  <b>(Replaced by chapter 51-47 WAC)</b></p>	
51-26-1802	Application. [Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1802, filed 12/23/92, effective 7/1/93. Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1802, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-27-001	Authority. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-067, § 51-27-001, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-26-1803	Water efficiency standards. [Statutory Authority: Chapter 19.27 RCW. 95-01-124, § 51-26-1803, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1803, filed 12/23/92, effective 7/1/93. Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1803, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-27-002	Purpose. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-067, § 51-27-002, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-26-1804	Metering valves. [Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1804, filed 12/23/92, effective 7/1/93. Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1804, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-27-003	Uniform Plumbing Code standards. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-067, § 51-27-003, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-26-1805	Implementation. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1805, filed 12/13/91, effective 7/1/92.] Repealed by 93-01-164, filed 12/23/92, effective 7/1/93. Statutory Authority: RCW 19.27.170.	51-27-004	Exceptions. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-067, § 51-27-004, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-26-1810	Reserved. [Statutory Authority: Chapter 19.27 RCW. 95-01-124, § 51-26-1810, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1810, filed 12/23/92, effective 7/1/93.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-27-008	Implementation. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-067, § 51-27-008, filed 12/13/91, effective 7/1/92.] Repealed by 98-02-055, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-26-1820	Reserved. [Statutory Authority: Chapter 19.27 RCW. 95-01-124, § 51-26-1820, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1820, filed 12/23/92, effective 7/1/93.]	<p style="text-align: center;"><b>Chapter 51-30</b>  <b>STATE BUILDING CODE ADOPTION AND AMENDMENT</b>  <b>OF THE 1994 EDITION OF THE UNIFORM BUILDING CODE</b>  <b>(Replaced by chapter 51-40 WAC)</b></p>	
		51-30-001	Authority. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-001, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
		51-30-002	Purpose. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-002, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-30-003	Uniform Building Code. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-003, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0305	Section 305—Requirements for Group E Occupancies. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0305, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-004	Conflicts with Washington State Ventilation and Indoor Air Quality Code. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-004, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0307	Section 307—Requirements for Group H Occupancies. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0307, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-005	Uniform Building Code requirements for barrier-free accessibility. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-005, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0310	Section 310—Requirements for Group R Occupancies. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0310, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-007	Exceptions. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-007, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0313	Section 313—Requirements for Group LC Occupancies. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0313, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-008	Implementation. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-008, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0400	Chapter 4—Special use and occupancy. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0400, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-009	Recyclable materials and solid waste storage. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-009, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0403	Section 403—Special provisions for Group B office buildings and Group R, Division 1 Occupancies. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0403, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-0100	Chapter 1—Administration. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0100, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0405	Section 405—Stages and platforms. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0405, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-0104	Section 104—Organization and enforcement. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0104, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0500	Chapter 5—General building limitations. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0500, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-0200	Chapter 2—Definitions and abbreviations. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0200, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0510	Section 510—Heating. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0510, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-0204	Section 204—C. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0204, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0600	Chapter 6—Types of construction. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0600, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-0207	Section 207—F. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0207, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0601	Section 601—Classification of all buildings by types of construction and general requirements. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0601, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-0217	Section 217—P. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0217, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0800	Chapter 8—Interior finishes. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0800, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-0220	Section 220—S. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0220, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0804	Section 804—Maximum allowable flame spread. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0804, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-0300	Chapter 3—Use or occupancy. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0300, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0900	Chapter 9—Fire-protection systems. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0900, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-0302	Section 302—Mixed use or occupancy. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0302, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0902	Section 902—Standards of quality. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0902, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-0304	Section 304—Requirements for Group B Occupancies. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-0304, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-0904	Section 904—Fire-extinguishing systems. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129,

	§ 51-30-0904, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.		98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1000	Chapter 10—Means of egress. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1000, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1106	Section 1106—Accessible design and standards. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1106, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1001	Section 1001—General. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1001, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1107	Section 1107—Parking facilities. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1107, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1004	Section 1004—Doors. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1004, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1108	Section 1108—Passenger loading zones. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1108, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1005	Section 1005—Corridors and exterior exit balconies. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1005, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1109	Section 1109—Scope. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1109, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1006	Section 1006—Stairways. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1006, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1110	Section 1110—Definitions. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1110, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1007	Section 1007—Ramps. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1007, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1111	Section 1111—Additions. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1111, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1009	Section 1009—Stairway, Ramp and Escalator Enclosures. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1009, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1112	Section 1112—Alterations. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1112, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1014	Section 1014—Aisles. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1014, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1113	Section 1113—Historic preservation. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1113, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1019	Group I Occupancies. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1019, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1114	Section 1114—Appeal. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1114, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1030	Table 10-A—Minimum egress requirements. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1030, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1120	Table No. 11-A. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1120, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1100	Chapter 11—Accessibility. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1100, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1121	Table No. 11-B. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1121, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1101	Section 1101—Scope. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1101, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1122	Table No. 11-C. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1122, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1102	Section 1102—Definitions. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1102, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1123	Table No. 11-D. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1123, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1103	Section 1103—Building accessibility. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1103, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1124	Table No. 11-E. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1124, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1104	Section 1104—Egress and areas of evacuation assistance. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1104, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-1125	Table No. 11-F. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1125, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1105	Section 1105—Facility accessibility. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1105, filed 12/21/94, effective 6/30/95.] Repealed by	51-30-1200	Chapter 12—Interior environment. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1200, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
		51-30-1203	Section 1203—Light and ventilation in Group R Occupancies. [Statutory Authority: Chapters 19.27 and 70.92

	RCW. 95-01-129, § 51-30-1203, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.		98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1600	Chapter 16—Structural forces. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1600, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-31200	Section 31.200. [Statutory Authority: RCW 19.27.074(1) and 70.94.457 (1)(b), (c). 96-01-120, § 51-30-31200, filed 12/20/95, effective 1/1/97.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1614	Section 1614—Definitions. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1614, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-31201	Section 31.201—Definitions. [Statutory Authority: RCW 19.27.074(1) and 70.94.457 (1)(b), (c). 96-01-120, § 51-30-31201, filed 12/20/95, effective 1/1/97.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1700	Chapter 17—Structural test and inspections. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1700, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-31202	Section 31.202—Testing. [Statutory Authority: RCW 19.27.074(1) and 70.94.457 (1)(b), (c). 96-01-120, § 51-30-31202, filed 12/20/95, effective 1/1/97.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1702	Section 1702—Structural observation. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1702, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-31203	Section 31.203—Test protocol. [Statutory Authority: RCW 19.27.074(1) and 70.94.457 (1)(b), (c). 96-01-120, § 51-30-31203, filed 12/20/95, effective 1/1/97.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1900	Chapter 19—Concrete. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1900, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-31204	Section 31.204—Approval procedure for fireplaces. [Statutory Authority: RCW 19.27.074(1) and 70.94.457 (1)(b), (c). 96-01-120, § 51-30-31204, filed 12/20/95, effective 1/1/97.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-1909	Section 1909—Strength and serviceability requirements. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-1909, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-31205	Section 31.205—Approval of non-tested fireplaces. [Statutory Authority: RCW 19.27.074(1) and 70.94.457 (1)(b), (c). 96-01-120, § 51-30-31205, filed 12/20/95, effective 1/1/97.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-2200	Chapter 22—Steel. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-2200, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-31206	Section 31.206—Approval through alternative test protocol. [Statutory Authority: RCW 19.27.074(1) and 70.94.457 (1)(b), (c). 96-01-120, § 51-30-31206, filed 12/20/95, effective 1/1/97.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-2211	Section 2211—Steel structures resisting forces induced by earthquake motions in seismic zones 3 and 4. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-2211, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-31207	Section 31.207—Approval termination. [Statutory Authority: RCW 19.27.074(1) and 70.94.457 (1)(b), (c). 96-01-120, § 51-30-31207, filed 12/20/95, effective 1/1/97.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-2400	Chapter 24—Glass and glazing. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-2400, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-31208	Section 31.208—Quality control. [Statutory Authority: RCW 19.27.074(1) and 70.94.457 (1)(b), (c). 96-01-120, § 51-30-31208, filed 12/20/95, effective 1/1/97.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-2406	Section 2406—Safety glazing. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-2406, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-31209	Section 31.209—Permanent label, temporary label and owner's manual. [Statutory Authority: RCW 19.27.074(1) and 70.94.457 (1)(b), (c). 96-01-120, § 51-30-31209, filed 12/20/95, effective 1/1/97.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-2900	Chapter 29—Plumbing systems. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-2900, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-31210	Section 31.210—List of approved fireplaces. [Statutory Authority: RCW 19.27.074(1) and 70.94.457 (1)(b), (c). 96-01-120, § 51-30-31210, filed 12/20/95, effective 1/1/97.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-2902	Section 2902—Number of fixtures. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-2902, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-3400	Chapter 34—Existing structures. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-3400, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-2903	Section 2903—Accessibility. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-2903, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-3404	Section 3404—Moved buildings. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-3404, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-2904	Section 2904—Plumbing fixtures. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-2904, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-93115	Section 93115. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-93115, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-2910	Table 29-A—Minimum plumbing fixtures. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-2910, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-30-93116	Section 93116. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-93116, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-30-3102	Section 3102.5.4. [Statutory Authority: RCW 19.27.074(1) and 70.94.457 (1)(b), (c). 96-01-120, § 51-30-3102, filed 12/20/95, effective 1/1/97.] Repealed by		

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- 51-30-93117 Section 93117. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-93117, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-30-93118 Section 93118. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-93118, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-30-93119 Section 93119. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-93119, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-30-93120 Section 93120. [Statutory Authority: Chapters 19.27 and 70.92 RCW. 95-01-129, § 51-30-93120, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-054, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

**Chapter 51-32**  
**STATE BUILDING CODE ADOPTION AND AMENDMENT OF**  
**THE 1994 EDITION OF THE UNIFORM MECHANICAL CODE**  
**(Replaced by chapter 51-42 WAC)**

- 51-32-001 Authority. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-001, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-002 Purpose. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-002, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-003 Uniform Mechanical Code. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-003, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-004 Conflict between Uniform Mechanical Code and State Energy Code chapter 51-11 WAC. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-004, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-005 Conflict between Uniform Mechanical Code and State Ventilation and Indoor Air Quality Code chapter 51-13 WAC. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-005, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-007 Exceptions. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-007, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-008 Implementation. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-008, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-0200 Chapter 2—Definitions. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-0200, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-0223 Section 223—U. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-0223, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-0300 Chapter 3—General requirements for heating, ventilating and cooling. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-0300, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-0327 Section 327—Room heaters and unvented decorative gas logs and fireplaces. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-0327, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

- 51-32-0500 Chapter 5—Exhaust systems. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-0500, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-0504 Section 504—Environmental air ducts. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-0504, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-0600 Chapter 6—Duct systems. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-0600, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-0601 Section 601—Scope. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-0601, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-0605 Section 605—Dampers in duct systems. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-0605, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-1100 Refrigeration. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-32-1100, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-1101 General. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-32-1101, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-1102 System requirements. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-32-1102, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-1103 Refrigeration system classification. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-32-1103, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-1104 Refrigerant classification and system requirements. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-32-1104, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-1105 Machinery room, general requirements. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-32-1105, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-1106 Machinery room, special requirements. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-32-1106, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-1107 Refrigerant piping. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-32-1107, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-1108 Field test. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-32-1108, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-1300 Appendix B, Chapter 13—Fuel-gas piping. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-1300, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-1312 Section 1312—Material for gas piping. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-1312, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-32-1313 Section 1313—Installation of gas piping. [Statutory Authority: Chapter 19.27 RCW. 95-01-123, § 51-32-1313, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-056, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

**Chapter 51-34**  
**STATE BUILDING CODE ADOPTION AND AMENDMENT OF**  
**THE 1994 EDITION OF THE UNIFORM FIRE CODE**  
**(Replaced by chapter 51-44 WAC)**

51-34-001	Authority. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-001, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-2500	Article 25—Places of assembly. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-2500, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-002	Purpose. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-002, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-2501	Section 2501—General. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-2501, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-003	Uniform Fire Code. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-003, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-5200	Article 52—Motor vehicle fuel-dispensing stations. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-5200, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-007	Exceptions. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-007, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-5201	Section 5201—General. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-5201, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-008	Implementation. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-008, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-5204	Section 5204—Compressed natural gas motor vehicle fuel-dispensing stations. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-5204, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-0200	Article 2—Definitions and abbreviations. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-0200, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-6100	Article 61—Oil-burning equipment. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-6100, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-0206	Section 206—E. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-0206, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-6103	Section 6103—Permits. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-6103, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-0216	Section 216—O. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-0216, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-6104	Section 6104—Electrical wiring and equipment. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-6104, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-0219	Section 219—R. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-0219, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-6105	Section 6105—Fuel oil. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-6105, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-0223	Section 223—V. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-0223, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-6106	Section 6106—Abandonment of tanks. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-6106, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-0900	Article 9—Fire department access and water supply. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-0900, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-6107	Section 6107—Portable unvented oil-burning heating appliances and unvented decorative gas logs and fireplaces. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-6107, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-0901	Section 901—General. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-0901, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-6301	Scope. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6301, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-0902	Section 902—Fire department access. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-0902, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-6302	Classification. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6302, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-1000	Article 10—Fire-protection systems and equipment. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-1000, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-6303	Definitions. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6303, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-1003	Section 1003—Fire-extinguishing systems. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-1003, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-6304	Permits and plans. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6304, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-1007	Section 1007—Fire alarm systems. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-1007, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-6305	Installation and maintenance. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6305, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
		51-34-6306	Access. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6306, filed 12/19/96, effective 7/1/97.]

	Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.		filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6307	Emergency control box. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6307, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-6324	Records. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6324, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6308	Treatment and flaring systems for discharge. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6308, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-7800	Article 78—Fireworks and pyrotechnic special effects material. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-7800, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6309	Ammonia discharge. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6309, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-7802	Section 7802—Fireworks. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-7802, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6310	Refrigeration machinery rooms. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6310, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-7900	Article 79—Flammable and combustible liquids. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-7900, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6311	Refrigeration machinery room ventilation. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6311, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-7902	Section 7902—Storage. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-7902, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6312	Refrigerated process and storage areas. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6312, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-7904	Section 7904—Special operations. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-7904, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6313	Detection and alarm systems. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6313, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-8000	Article 80—Hazardous materials. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-8000, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6314	Refrigeration machinery room equipment and controls. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6314, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-8001	Section 8001—General. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-8001, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6315	Refrigerant control valves. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6315, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-8003	Section 8003—Storage. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-8003, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6316	Protection from mechanical damage. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6316, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-9100	Appendix II-F—Protected aboveground tanks for motor vehicle fuel-dispensing stations outside buildings. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-9100, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6317	Electrical. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6317, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-9101	Section 1—Scope. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-9101, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6318	Instructions. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6318, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-9102	Section 2—Definitions. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-9102, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6319	Emergency signs and labels. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6319, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-9103	Section 3—Permits and plans. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-9103, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6320	Testing of equipment. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6320, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-9104	Section 4—Tank design. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-9104, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6321	Notification of discharges. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6321, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-9105	Section 5—Installation of tanks. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-9105, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6322	Storage, handling and use. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6322, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-34-9106	Section 6—Installation of dispensing and piping systems. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-9106, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-34-6323	Changing of refrigerant type. [Statutory Authority: RCW 19.27.074. 97-01-135, § 51-34-6323, filed 12/19/96, effective 7/1/97.] Repealed by 98-02-053,		



51-34-9107 Section 7—Parking of tank vehicles. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-9107, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-34-9108 Section 8—Maintenance. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-34-9108, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

#### Chapter 51-35

#### STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 1994 EDITION OF THE UNIFORM FIRE CODE STANDARDS (Replaced by chapter 51-45 WAC)

51-35-001 Authority. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-001, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-002 Purpose. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-002, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-003 Uniform Fire Code Standards. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-003, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-007 Exceptions. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-007, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-008 Implementation. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-008, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52000 Uniform Fire Code Standard 52-1 compressed natural gas (CNG) vehicular fuel systems. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52000, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52400 Chapter 4—CNG compression, storage, and dispensing systems. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52400, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52440 Section 52440. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52440, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52441 Section 52441. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52441, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52442 Section 52442. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52442, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52500 Chapter 5—Vehicle fueling appliances. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52500, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52510 Section 52510. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52510, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52520 Section 52520. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52520, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52530 Section 52530. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52530, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98,

effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52540 Section 52540. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52540, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52550 Section 52550. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52550, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52560 Section 52560. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52560, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52570 Section 52570. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52570, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52580 Section 52580. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52580, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52590 Section 52590. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52590, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-35-52600 Chapter 6—Reserved. [Statutory Authority: Chapter 19.27 RCW. 95-01-125, § 51-35-52600, filed 12/21/94, effective 6/30/95.] Repealed by 98-02-053, filed 1/6/98, effective 7/1/98. Statutory Authority: RCW 19.27.031 and 19.27.074.

#### Chapter 51-40

#### STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 1997 EDITION OF THE UNIFORM BUILDING CODE

51-40-001 Authority. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-001, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-40-002 Purpose. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-002, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-40-003 Uniform Building Code. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-003, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-40-004 Conflicts with Washington State Ventilation and Indoor Air Quality Code. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-004, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-40-005 Uniform Building Code requirements for barrier-free accessibility. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-005, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-40-007 Exceptions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-24-078, § 51-40-007, filed 12/1/98, effective 7/1/99; 98-02-054, § 51-40-007, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-40-008 Implementation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-008, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-40-009 Recyclable materials and solid waste storage. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-009, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-40-0200	Chapter 2—Definitions and abbreviations. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-0200, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-0200, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.		
51-40-0302	Section 302—Mixed use or occupancy. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-0302, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-0905	Section 905—Smoke control. [Statutory Authority: RCW 19.27.031, 19.27.074. 03-01-055, § 51-40-0905, filed 12/11/02, effective 7/1/03.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0303	Section 303—Requirements for Group A Occupancies. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-0303, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1000	Chapter 10—Means of egress. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1000, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0304	Section 304—Requirements for Group B Occupancies. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-0304, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1002	Definitions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1002, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0305	Section 305—Requirements for Group E Occupancies. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-0305, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1003	General egress requirements. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-1003, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-1003, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0307	Section 307—Requirements for Group H Occupancies. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-0307, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1004	The exit access. [Statutory Authority: RCW 19.27.031, 19.27.074. 03-01-055, § 51-40-1004, filed 12/11/02, effective 7/1/03; 01-02-095, § 51-40-1004, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-1004, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0308	Section 308—Requirements for Group I Occupancies. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-0308, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1007	Means of egress requirements based on occupancy. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1007, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0310	Section 310—Requirements for Group R Occupancies. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-0310, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-0310, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1091	Table 10-A. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1091, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0311	Section 311—Requirements for Group S Occupancies. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-0311, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1100	Chapter 11—Accessibility. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1100, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0313	Section 313—Requirements for Group LC Occupancies. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-0313, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-0313, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1101	Section 1101—Scope. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1101, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0403	Section 403—Special provisions for Group B office buildings and Group R, Division 1 Occupancies. [Statutory Authority: RCW 19.27.031, 19.27.074. 03-01-055, § 51-40-0403, filed 12/11/02, effective 7/1/03; 98-02-054, § 51-40-0403, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1102	Section 1102—Definitions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1102, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0405	Section 405—Stages and platforms. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-0405, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1103	Section 1103—Building accessibility. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1103, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0510	Section 510—Heating. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-0510, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1104	Section 1104—Egress and areas of evacuation assistance. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-1104, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-1104, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0804	Section 804—Maximum allowable flame spread. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-0804, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1105	Section 1105—Facility accessibility. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-1105, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-1105, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0902	Section 902—Standards of quality. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-0902, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-0902, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1106	Section 1106—Accessible design and standards. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-1106, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-1106, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-0904	Section 904—Fire-extinguishing systems. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-0904, filed 1/6/98, effective 7/1/98.] Repealed	51-40-1107	Section 1107—Parking facilities. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1107, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-40-1108	Section 1108—Passenger loading zones. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1108, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1702	Section 1702—Structural observation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1702, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1109	Section 1109—Scope. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1109, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-1909	Section 1909—Strength and serviceability requirements. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1909, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1110	Section 1110—Definitions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1110, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-23110	Wood structural panel and particleboard shear walls tables. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-23110, filed 1/6/98, effective 7/1/98.] Repealed by 98-24-076, filed 12/1/98, effective 7/1/99. Statutory Authority: RCW 19.27.074, 19.27.031 and 19.27.074 (1)(a).
51-40-1111	Section 1111—Additions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1111, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-2406	Section 2406—Safety glazing. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-2406, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1112	Section 1112—Alterations. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1112, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-2900	Chapter 29—Plumbing systems. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-2900, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-2900, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1113	Section 1113—Historic preservation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1113, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-2929	Table 29-A—Minimum plumbing fixtures. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-2929, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1114	Section 1114—Appeal. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1114, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-3004	Hoistway venting. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-3004, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1191	Table No. 11-A. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1191, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-3102	Section 3102—Chimneys, fireplaces and barbecues. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-3102, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-3102, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1192	Table No. 11-B. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1192, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-31200	Section 31-2—Standard test method for particulate emissions from fireplaces. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-31200, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-31200, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1193	Table No. 11-C. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1193, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-3404	Section 3404—Moved buildings. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-3404, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1194	Table No. 11-D. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1194, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-93115	Section 93115. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-93115, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1195	Table No. 11-E. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1195, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-93116	Section 93116. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-93116, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1196	Table No. 11-F. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1196, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-93117	Section 93117. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-93117, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1202	Section 1202—Light and ventilation in Groups A, B, E, F, H, I, M and S Occupancies. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-1202, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-93118	Section 93118. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-93118, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1203	Section 1203—Light and ventilation in Group R Occupancies. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-095, § 51-40-1203, filed 1/3/01, effective 7/1/01; 98-02-054, § 51-40-1203, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-93119	Section 93119. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-93119, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-40-1616	Section 1616—Definitions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-1616, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-40-93120	Section 93120. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-054, § 51-40-93120, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-108, filed

12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

**Reviser's note:** Later promulgation, see chapter 51-50 WAC.

#### Chapter 51-42

#### STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 1997 EDITION OF THE UNIFORM MECHANICAL CODE

- 51-42-001 Authority. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-001, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-002 Purpose. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-002, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-003 Uniform Mechanical Code. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-003, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-004 Conflict between Uniform Mechanical Code and State Energy Code chapter 51-11 WAC. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-004, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-005 Conflict between Uniform Mechanical Code and State Ventilation and Indoor Air Quality Code chapter 51-13 WAC. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-005, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-007 Exceptions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-24-078, § 51-42-007, filed 12/1/98, effective 7/1/99; 98-02-056, § 51-42-007, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-008 Implementation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-008, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-0200 Chapter 2—Definitions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-0200, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-0223 Section 223—U. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-0223, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-0303 Section 303—Installation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-0303, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-0405 Section 405—Direct gas-fired make-up air systems. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-0405, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-0504 Environmental air ducts. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-0504, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-0600 Chapter 6—Duct systems. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-0600, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-0601 Scope. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-0601, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-42-0605 Dampers in duct systems. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-0605,

filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-0901

Vented decorative appliances, decorative gas appliances for installation in solid-fuel-burning fireplaces, gas-fired log lighters, unvented decorative gas logs and decorative fireplaces. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-0901, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1000

Chapter 10—Boiler/water heaters. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1000, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1002

General. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1002, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1004

Safety devices. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1004, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1005

Steam and hot-water boilers. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1005, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1100

Chapter 11—Refrigeration. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1100, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1101

General. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1101, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1102

System requirements. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1102, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1103

Refrigeration system classification. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1103, filed 1/3/01, effective 7/1/01; 98-02-056, § 51-42-1103, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1104

Refrigerant classification and system requirements. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1104, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1105

Machinery room, general requirements. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1105, filed 1/3/01, effective 7/1/01; 98-02-056, § 51-42-1105, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1106

Machinery room, special requirements. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1106, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1107

Refrigerant piping. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1107, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1108

Field test. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1108, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1109

Refrigerant piping, containers and valves. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1109, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-42-1110	Erection of refrigerant piping. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1110, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.		12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1111	Refrigerant control valves. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1111, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-42-1311	Material for gas piping. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1311, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1112	Pressure-limiting devices. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1112, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-42-1312	Installation of gas piping. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1312, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1113	Pressure-relief devices. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1113, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-42-1401	Oil-burning appliances. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-056, § 51-42-1401, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1114	Pressure-relief device settings. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1114, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	<b>Reviser's note:</b> Later promulgation, see chapter 51-52 WAC.	
51-42-1115	Marking of pressure-relief devices. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1115, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	<b>Chapter 51-44</b> <b>STATE BUILDING CODE ADOPTION AND AMENDMENT OF</b> <b>THE 1997 EDITION OF THE UNIFORM FIRE CODE</b>	
51-42-1116	Over-pressure protection. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1116, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.		
51-42-1117	Discharge piping. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1117, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-44-001	Authority. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-001, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1118	Special discharge requirements. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1118, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-44-002	Purpose. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-002, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1119	Ammonia discharge. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1119, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-44-003	Uniform Fire Code. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-003, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1120	Detection and alarm systems. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1120, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-44-007	Exceptions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-007, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1121	Equipment identification. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1121, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-44-008	Implementation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-008, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1122	Testing of refrigeration equipment. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1122, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-44-0103	Section 103—Inspection and enforcement. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-096, § 51-44-0103, filed 1/3/01, effective 7/1/01; 98-02-053, § 51-44-0103, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1123	Maintenance and operation. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1123, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-44-0105	Section 105.8—Permit required. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-096, § 51-44-0105, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1124	Storage of refrigerants and refrigerant oils. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1124, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-44-0200	Article 2—Definitions and abbreviations. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-096, § 51-44-0200, filed 1/3/01, effective 7/1/01; 98-02-053, § 51-44-0200, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1126	Tables not adopted. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1126, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.	51-44-0900	Article 9—Fire department access and water supply. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-0900, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
51-42-1301	Section 1301—General. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-098, § 51-42-1301, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-104, filed	51-44-1003	Section 1003—Fire-extinguishing systems. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-1003, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
		51-44-1007	Section 1007—Fire alarm systems. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-096, § 51-44-1007, filed 1/3/01, effective 7/1/01; 98-02-053, § 51-44-1007, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
		51-44-10210	Appendix II-J—Storage of flammable and combustible liquids in tanks located within below-grade vaults. [Stat-

- 51-44-1102 utory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-10210, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074. Section 1102—Incineration, open burning and commercial barbecue pits. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-096, § 51-44-1102, filed 1/3/01, effective 7/1/01.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-44-1109 Section 1109—Control of sources of ignition. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-096, § 51-44-1109, filed 1/3/01, effective 7/1/01; 98-02-053, § 51-44-1109, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-44-2500 Article 25—Places of assembly. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-096, § 51-44-2500, filed 1/3/01, effective 7/1/01; 98-02-053, § 51-44-2500, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-44-5200 Article 52—Motor vehicle fuel-dispensing stations. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-096, § 51-44-5200, filed 1/3/01, effective 7/1/01; 98-02-053, § 51-44-5200, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-44-6100 Article 61—Oil-burning equipment. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-6100, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-44-6300 Article 63—Refrigeration. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-6300, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-44-7404 Section 7404—Medical gas systems. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-7404, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-44-7802 Section 7802—Fireworks. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-7802, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-44-7900 Article 79—Flammable and combustible liquids. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-096, § 51-44-7900, filed 1/3/01, effective 7/1/01; 98-02-053, § 51-44-7900, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-44-8000 Article 80—Hazardous materials. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-44-8000, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

**Reviser's note:** Later promulgation, see chapter 51-54 WAC.

#### Chapter 51-45

#### STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 1997 EDITION OF THE UNIFORM FIRE CODE STANDARDS

- 51-45-001 Authority. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-45-001, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-45-002 Purpose. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-45-002, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-45-003 Uniform Fire Code Standards. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-45-003, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
- 51-45-007 Exceptions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-45-007, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03,

effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

- 51-45-008 Implementation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-45-008, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

- 51-45-80400 Standard 80-4—Inert cryogenic fluid systems at consumer sites. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-053, § 51-45-80400, filed 1/6/98, effective 7/1/98.] Repealed by 04-01-105, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.

**Reviser's note:** Later promulgation, see chapter 51-54 WAC.

#### Chapter 51-46

#### STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 1997 EDITION OF THE UNIFORM PLUMBING CODE

- 51-46-001 Authority. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-001, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
- 51-46-002 Purpose. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-002, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
- 51-46-003 Uniform Plumbing Code. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-003, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
- 51-46-007 Exceptions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-24-078, § 51-46-007, filed 12/1/98, effective 7/1/99; 98-02-055, § 51-46-007, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
- 51-46-008 Implementation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-008, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
- 51-46-0100 Chapter 1—Administration. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0100, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
- 51-46-0101 Section 101 Title, scope and general. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0101, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
- 51-46-0102 Organization and enforcement. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0102, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
- 51-46-0103 Section 103 Permits and inspections. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0103, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
- 51-46-0200 Chapter 2—Definitions. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-097, § 51-46-0200, filed 1/3/01, effective 7/1/01; 98-02-055, § 51-46-0200, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
- 51-46-0205 Section 205.0 - C. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0205, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
- 51-46-0215 Section 215.0 - M. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0215, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
- 51-46-0218 Section 218.0 - P. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0218, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114,

	filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.		effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0300	Chapter 3—General regulations. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0300, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0509	Prohibited locations. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0509, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0301	Materials—Standards and alterations. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0301, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0512	Venting of water heaters. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0512, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0310	Workmanship. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0310, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0513	Limitations. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0513, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0311	Prohibited fittings and practices. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0311, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0514	Vent connectors. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0514, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0313	Protection of piping, materials, and structures. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0313, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0515	Location and support of venting system. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0515, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0314	Hangers and supports. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0314, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0516	Length pitch and clearance. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0516, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0316	Joints and connections. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0316, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0517	Vent termination. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0517, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0392	Table 3-2 Hangers and supports. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0392, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0518	Area of venting system. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0518, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0400	Chapter 4—Plumbing fixtures and fixture fittings. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0400, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0519	Multiple appliance venting. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0519, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0402	Water-conserving fixtures and fittings. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0402, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0520	Existing venting system. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0520, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0412	Floor drains and shower stalls. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0412, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0521	Draft hoods. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0521, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0413	Minimum number of required fixtures. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0413, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0522	Gas venting into existing masonry chimneys. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0522, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0500	Chapter 5—Water heaters. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0500, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0523	Installation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0523, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0501	General. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0501, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0524	Mechanical draft systems. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0524, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0502	Definitions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0502, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0525	Venting through ventilating hoods and exhaust systems. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0525, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0505	Gas-fired water heater approval requirements. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0505, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0600	Water supply and distribution. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0600, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0507	Combustion air. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0507, filed 1/6/98,		



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51-46-0603	Cross-connection control. [Statutory Authority: RCW 19.27.031, 19.27.074. 01-02-097, § 51-46-0603, filed 1/3/01, effective 7/1/01; 98-02-055, § 51-46-0603, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-0903	Materials. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0903, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0604	Materials. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0604, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-1000	Traps and interceptors. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-1000, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0608	Water pressure, pressure regulators, pressure relief valves, and vacuum relief valves. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0608, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-1003	Traps—Described. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-1003, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0609	Installation, testing, unions, and location. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0609, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-1012	Laundries. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-1012, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0610	Size of potable water piping. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0610, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-1300	Medical gas systems. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-1300, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0700	Sanitary drainage. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0700, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-1301	Scope. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-1301, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0701	Materials. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0701, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-1302	Definitions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-1302, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0704	Fixture connections (drainage). [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0704, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-1303	Plan review. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-1303, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0710	Drainage of fixtures located below the next upstream manhole or below the main sewer level. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0710, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-1304	System installation and performance testing. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-1304, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0713	Building sewers. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0713, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-1305	System verification. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-1305, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0793	Table 7-3 Drainage fixture unit values. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0793, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-1400	Referenced standards. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-1400, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0800	Indirect wastes. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0800, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-1401	Referenced standards. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-1401, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0810	Steam and hot water drainage condensers and sumps. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0810, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-1491	Table 14-1 Standards for materials, equipment, joints and connections. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-1491, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0814	Refrigeration wastes. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0814, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-97120	Appendix M—Storm drainage. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-97120, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0815	Air-conditioning equipment. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0815, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-97121	General. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-97121, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-0900	Vents. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-0900, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.	51-46-97122	Materials. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-97122, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
		51-46-97123	Traps on storm drains and leaders. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-97123, filed 1/6/98, effective 7/1/98.] Repealed by 02-

51-46-97124	01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074. Leaders, conductors, and connections. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-97124, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-97125	Roof drains. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-97125, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-97126	Size of leaders, conductors, and storm drains. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-97126, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-97127	Values for continuous flow. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-97127, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-97128	Testing. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-97128, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-46-97129	Tables M-1 through M-3. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-46-97129, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.

**Chapter 51-47****STATE BUILDING CODE ADOPTION OF APPENDIX I OF THE 1997 EDITION OF THE UNIFORM PLUMBING CODE**

51-47-001	Authority. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-47-001, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-47-002	Purpose. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-47-002, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-47-003	Uniform Plumbing Code Standards. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-47-003, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-47-007	Exceptions. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-47-007, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.
51-47-008	Implementation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 98-02-055, § 51-47-008, filed 1/6/98, effective 7/1/98.] Repealed by 02-01-114, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27.031, 19.27.074.

**Chapter 51-04 WAC****POLICIES AND PROCEDURES FOR CONSIDERATION OF STATEWIDE AND LOCAL AMENDMENTS TO THE STATE BUILDING CODE****WAC**

51-04-010	Declaration of purpose.
51-04-015	Definitions.
51-04-018	Petition for preliminary review.
51-04-020	Policies for the consideration of proposed statewide amendments.
51-04-025	Procedure for submittal or proposed statewide amendments.
51-04-030	Policies for consideration of proposed local government residential amendments.
51-04-035	Procedure for submittal of proposed local government residential amendments.
51-04-037	Preapproved local government residential amendments.
51-04-040	Reconsideration.

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51-04-050	Ex parte communications.
51-04-060	Opinions.
51-04-070	Council mailing address.

**WAC 51-04-010 Declaration of purpose.** The Washington state building code council, hereinafter called the council, is required by chapter 266, Laws of 1988, to adopt and maintain the state building code, hereinafter referred to as the building code, as provided in chapters 19.27, 19.27A, and 70.92 RCW, and the state legislature.

The primary objective of the council is to encourage consistency in the building code throughout the state of Washington and to maintain the building code consistent with the state's interest as provided in RCW 19.27.020.

The building code shall be as defined in WAC 51-04-015(6).

The council is also required by RCW 19.27.074 to approve or deny all city and county amendments to the building code that apply to single family or multifamily buildings as defined in RCW 19.27.015.

The purpose of this chapter is to establish policies and procedures for submittal and council review and consideration of proposed statewide and city and county amendments respectively, to the building code.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-010, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-04-010, filed 9/1/76.]

**WAC 51-04-015 Definitions.** (1) "Supplements and accumulative supplements" mean the publications between editions of the model codes and standards which include changes to the current edition of the model codes and standards.

(2) "Council" means the Washington state building code council.

(3) "Emergency statewide amendment" means any proposed statewide amendment, the adoption of which is necessary immediately in order to protect life, safety or health of building occupants; preserve the structural integrity of buildings built to the state building code; to correct errors and omissions; or by the direction of the Washington state legislature or federal legislation. Emergency statewide amendments to the state building code must be adopted in accordance with the Administrative Procedure Act, chapter 34.05 RCW.

(4) "Local government amendment" means any amendment to the state building code, as adopted by cities or counties for implementation and enforcement in their respective jurisdictions.

(5) "Local government residential amendment" means any amendment to the state building code, as adopted by cities or counties for implementation and enforcement in their respective jurisdictions, that applies to single and multifamily buildings as defined by RCW 19.27.015.

(6) "Model codes" means the codes developed by the model code organizations and adopted by and referenced in chapter 19.27 RCW.

(7) "Model code organization(s)" means the national code-promulgating organizations that develop the model codes (as defined herein), such as the International Code Council, International Association of Plumbing and Mechanical Officials, and National Fire Protection Association.

(8) "State building code" means the codes adopted by and referenced in chapter 19.27 RCW; the state energy code; and any other codes so designated by the Washington state legislature as adopted and amended by the council.

(9) "Statewide amendment" means any amendment to the building code, initiated through council action or by petition to the council from any agency, city or county, or interested individual or organization, that would have the effect of amending the building code for the entire state of Washington. Statewide amendments to the state building code must be adopted in accordance with the Administrative Procedure Act, chapter 34.05 RCW.

(10) "State building code update cycle" means that period during which the model code and standards referenced in chapter 19.27 RCW are updated and amended by the council in accordance with the Administrative Procedure Act, chapter 34.05 RCW hereinafter referred to as the "adoption period" and those additional periods when code changes are received for review as proposed amendments to the model codes, hereinafter referred to as "submission periods."

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 05-23-104, § 51-04-015, filed 11/17/05, effective 1/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-107, § 51-04-015, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.035 and 19.27.074. 98-24-077, § 51-04-015, filed 12/1/98, effective 7/1/99. Statutory Authority: RCW 19.27.074. 98-02-048, § 51-04-015, filed 1/5/98, effective 7/1/98. Statutory Authority: RCW 19.27.035 and chapter 34.05 RCW. 94-05-058, § 51-04-015, filed 2/10/94, effective 3/13/94. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-015, filed 1/3/90, effective 2/3/90.]

**WAC 51-04-018 Petition for preliminary review.** An agency, city or county, or other interested individual or organization wishing to submit statewide or local government residential amendments to the building code for council consideration, may file with the council a petition for preliminary review of the statewide or local government residential amendment, in order to solicit comments from council members and interested parties, prior to council action.

The council may refer a petition for preliminary review to one of the council standing committees for review and comment.

[Statutory Authority: RCW 19.27.035 and chapter 34.05 RCW. 94-05-058, § 51-04-018, filed 2/10/94, effective 3/13/94. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-018, filed 1/3/90, effective 2/3/90.]

**WAC 51-04-020 Policies for the consideration of proposed statewide amendments.** Statewide and emergency statewide amendments to the state building code should be based on one of the following criteria:

- (1) The amendment is needed to address a critical life/safety need.
- (2) The amendment is needed to address a specific state policy or statute.
- (3) The amendment is needed for consistency with state or federal regulations.
- (4) The amendment is needed to address a unique character of the state.
- (5) The amendment corrects errors and omissions.

Statewide and emergency statewide amendments to the state building code shall conform to the purposes, objectives, and standards prescribed in RCW 19.27.020.

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The council will accept and consider petitions for emergency statewide amendments to the building code at any time, in accordance with RCW 19.27.074 and chapter 34.05 RCW.

The council will accept and consider all other petitions for statewide amendments in conjunction with the state building code update cycle, in accordance with RCW 19.27.074 and chapter 34.05 RCW, and WAC 51-04-015 and 51-04-020 as follows:

The state building code council shall publicize the state building code amendment process in January of each year. Proposed state amendments must be received by March 1 to be considered for adoption by December 1. The state building code council shall review all proposed statewide amendments and file for future rule making those proposals approved as submitted or as amended by the council. State amendments as approved by the council shall be submitted to the appropriate model code organization, at the direction of the council, except those adopted for consistency with state statutes or regulation and held for further review during the adoption period of those model codes by the council. The effective date of any statewide amendments shall be the same as the effective date of the new edition of the model codes, except for emergency amendments adopted in accordance with chapter 34.05 RCW and deemed appropriate by the council.

The adoption period of new model codes commences upon availability of the publication of the new edition of the model codes and concludes with formal adoption of the building code as amended by the council and final review by the state legislature. For the purposes of this section, the publication of supplements shall not be considered a new edition. The council will consider state amendments to:

The model codes provided that the proposed amendments shall be limited to address changes in the model codes since the previous edition; or, address existing statewide amendments to the model codes; or, address portions of the state building code other than the model codes.

The state building code council shall consider the action of the model code organizations in their consideration of these proposals.

Within sixty days of the receipt of the new edition of the model codes the council shall enter rule making to update the state building code.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 05-23-104, § 51-04-020, filed 11/17/05, effective 1/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-107, § 51-04-020, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.035 and chapter 34.05 RCW. 94-05-058, § 51-04-020, filed 2/10/94, effective 3/13/94. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-020, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-04-020, filed 9/1/76.]

**WAC 51-04-025 Procedure for submittal or proposed statewide amendments.** All proposed statewide amendments shall be submitted in writing to the council, on the form provided by the council.

Petitions for statewide amendments to the building code shall be submitted to the council during the submission period and the adoption period in accordance with WAC 51-04-020.

Petitions for emergency statewide amendments to the building code may be submitted at any time, in accordance

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with RCW 19.27.074 and chapter 34.05 RCW, and WAC 51-04-015 and 51-04-020.

The council may refer a proposed statewide amendment to one of the council standing committees for review and comment prior to council action in accordance with chapter 34.05 RCW.

The council shall deal with all proposed statewide amendments within the time frames required by chapter 19.27 RCW, RCW 34.05.330, and all other deadlines established by statute.

[Statutory Authority: RCW 19.27.035 and chapter 34.05 RCW, 94-05-058, § 51-04-025, filed 2/10/94, effective 3/13/94. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348, 90-02-108, § 51-04-025, filed 1/3/90, effective 2/3/90.]

**WAC 51-04-030 Policies for consideration of proposed local government residential amendments.** All amendments to the building code, as adopted by cities and counties for implementation and enforcement in their respective jurisdictions, that apply to single and multifamily buildings as defined by RCW 19.27.015, shall be submitted to the council for approval.

The council shall consider and approve or deny all proposed local government residential amendments to the building code within ninety days of receipt of a proposal, unless alternative scheduling is agreed to by the council and the proposing entity.

All local government residential amendments to the building code that require council approval shall be submitted in writing to the council, after the city or county legislative body has adopted the amendment and prior to implementation and enforcement of the amendment by the local jurisdiction. All local amendments submitted for review shall be accompanied by findings of fact adopted by the governing body of the local jurisdiction justifying the adoption of the local amendment in accordance with the five criteria noted below in this section.

It is the policy of the council to encourage joint proposals for local government residential amendments from more than one jurisdiction. Local government residential amendments submitted to the council for approval should be based on:

- (1) Climatic conditions that are unique to the jurisdiction.
- (2) Geologic or seismic conditions that are unique to the jurisdiction.
- (3) Environmental impacts such as noise, dust, etc., that are unique to the jurisdiction.
- (4) Life, health, or safety conditions that are unique to the local jurisdiction.
- (5) Other special conditions that are unique to the jurisdiction.

**EXCEPTIONS:** Appendices or portions thereof that have the effect of amending the uniform codes, that do not conflict with the building code for single and multifamily residential buildings as defined by RCW 19.27.015, may be adopted by local jurisdictions without council review or approval.

Local government residential amendments to administrative provisions (departmental operational procedures) contained within the state building code need not be submitted to the council for review and approval provided that such amendments do not alter the construction requirements of those chapters.

Those portions of the supplement or accumulative supplements that affect single and multifamily residential buildings as defined by RCW 19.27.015 that are not adopted by the council shall be submitted to the council for consideration as local government residential amendments to the building code.

Local government residential amendments shall conform to the limitations provided in RCW 19.27.040.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW, 05-23-104, § 51-04-030, filed 11/17/05, effective 1/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074, 04-07-193, § 51-04-030, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.035 and 19.27.074, 98-24-077, § 51-04-030, filed 12/1/98, effective 7/1/99. Statutory Authority: Chapter 19.27 RCW, 95-01-127, § 51-04-030, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348, 90-02-108, § 51-04-030, filed 1/3/90, effective 2/3/90.]

**WAC 51-04-035 Procedure for submittal of proposed local government residential amendments.** All proposed local government residential amendments to the state building code shall be submitted in writing to the council, on a form provided by the council, along with findings of fact as required in WAC 51-04-030 for the proposed amendment. Local government residential amendments to administrative provisions (departmental operational procedures) contained within the state building code need not be submitted to the council for review and approval provided that such amendment does not affect the construction requirements of those chapters.

The council shall accept and consider all applications for review of local government residential amendments submitted to the council in a proper manner.

The council may refer a proposed local government residential amendment to one of the council standing committees for review and comment prior to council action in accordance with RCW 19.27.074.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW, 05-23-104, § 51-04-035, filed 11/17/05, effective 1/1/06. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348, 90-02-108, § 51-04-035, filed 1/3/90, effective 2/3/90.]

**WAC 51-04-037 Preapproved local government residential amendments.** Any local government residential amendment, that the council determines to be appropriate for adoption by other local governments, may be designated as a preapproved local government residential amendment.

A preapproved local government residential amendment may be adopted by any local government upon notification of the council.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348, 90-02-108, § 51-04-037, filed 1/3/90, effective 2/3/90.]

**WAC 51-04-040 Reconsideration.** Any party proposing a statewide or local government amendment to the building code may, upon denial of the amendment by the council, file a petition for reconsideration.

Within ten days of a building code council vote to deny a statewide or local government amendment, any party may file a petition for reconsideration, stating the specific justification for rule adoption or local amendment. The petition shall be filed with the State Building Code Council, P.O. Box 42525, Olympia, Washington 98504-2525.

The council is deemed to have denied the petition for reconsideration if, within sixty days from the date the petition is filed, the council does not either:

- (1) Dispose of the petition; or
- (2) Serve the parties with a written notice specifying the date by which it will act on the petition.

Unless the petition is deemed denied, the petition shall be disposed of by the council with recommendations from the same committee or committees that considered the proposed rule or local amendment. The disposition shall be in the form of a written notice denying the petition, granting the petition and refiling the rule-making order or approving the local amendment, or granting the petition and setting the matter for further hearings.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 05-23-104, § 51-04-040, filed 11/17/05, effective 1/1/06. Statutory Authority: RCW 19.27.035 and chapters 19.27 and 34.05 RCW. 02-01-113, § 51-04-040, filed 12/18/01, effective 7/1/02. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-040, filed 1/3/90, effective 2/3/90.]

**WAC 51-04-050 Ex parte communications.** All written communications received by council members during council rule-making proceedings, shall be forwarded to staff for inclusion in the public record.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-050, filed 1/3/90, effective 2/3/90.]

**WAC 51-04-060 Opinions.** RCW 19.27.031 grants the council authority to render opinions relating to the building code at the request of a local building official.

For the purposes of this section, the term "building official" means the local or state official, or their designee, responsible for implementation and enforcement of the specific code provision on which the opinion is requested.

Council building code related opinions shall be limited to the state regulations for barrier-free facilities, the state energy code, the state ventilation and indoor air quality code, and council amendments to the model codes.

Council related opinions may be developed and approved by a standing committee of the council.

Opinions approved by a standing committee may be reviewed and modified by the council.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-107, § 51-04-060, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.035 and 19.27.074. 98-24-077, § 51-04-060, filed 12/1/98, effective 7/1/99. Statutory Authority: RCW 19.27.035 and chapter 34.05 RCW. 94-05-058, § 51-04-060, filed 2/10/94, effective 3/13/94. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-060, filed 1/3/90, effective 2/3/90.]

**WAC 51-04-070 Council mailing address.** All requests for information, documentation, etc., should be submitted to:

Washington State Building Code Council  
906 Columbia St SW  
Post Office Box 42525  
Olympia, Washington 98504-2525  
360-725-2966

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 05-23-104, § 51-04-070, filed 11/17/05, effective 1/1/06. Statutory Authority: RCW 19.27.074. 98-02-048, § 51-04-070, filed 1/5/98,

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effective 7/1/98. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-070, filed 1/3/90, effective 2/3/90.]

## Chapter 51-06 WAC PUBLIC RECORDS

### WAC

51-06-010	Purpose of chapter.
51-06-020	Public records available.
51-06-070	Copying.
51-06-120	Address for communications.

### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

51-06-030	Definitions. [Order 76-02, § 51-06-030, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
51-06-040	Public records officer. [Order 76-02, § 51-06-040, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
51-06-050	Office hours. [Order 76-02, § 51-06-050, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
51-06-060	Requests for public records. [Order 76-02, § 51-06-060, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
51-06-080	Exemptions. [Order 76-02, § 51-06-080, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
51-06-090	Review of denials of public records requests. [Order 76-02, § 51-06-090, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
51-06-100	Protection of public records. [Order 76-02, § 51-06-100, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
51-06-110	Records index. [Order 76-02, § 51-06-110, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.

**WAC 51-06-010 Purpose of chapter.** The purpose of this chapter shall be to ensure compliance by the state building code council (hereinafter referred to as the "council"), including its members and staff, with the provisions of chapter 42.17 RCW (Initiative 276), and in particular with RCW 42.17.250 - 42.17.320 dealing with public records.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-06-010, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-06-010, filed 9/1/76.]

**WAC 51-06-020 Public records available.** All public records of the council as defined in WAC 51-06-030 are available for public inspection and copying at the Department of Community Development, 906 Columbia St. SW, Olympia, Washington 98504, pursuant to these rules, except as otherwise provided by RCW 42.17.310.

[Statutory Authority: RCW 19.27.074. 98-02-049, § 51-06-020, filed 1/5/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-06-020, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-06-020, filed 9/1/76.]

**WAC 51-06-070 Copying.** The department of community development may charge a fee of twenty-five cents per

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page for providing copies of public records and for use of the office's copy equipment.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348, 90-02-108, § 51-06-070, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-06-070, filed 9/1/76.]

**WAC 51-06-120 Address for communications.** All requests for information, documentation, etc., should be submitted to the:

Washington State Building Code Council  
906 Columbia St SW  
Post Office Box 48300  
Olympia, Washington 98504-8300  
(360) 586-0486

[Statutory Authority: RCW 19.27.074, 98-02-049, § 51-06-120, filed 1/5/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348, 90-02-108, § 51-06-120, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-06-120, filed 9/1/76.]

## Chapter 51-08 WAC

### UNIFORM PROCEDURAL RULES

#### WAC

51-08-010 Uniform procedural rules.

**WAC 51-08-010 Uniform procedural rules.** The state building code council, hereinafter referred to as the council, adopts as its own rules of practice all those uniform procedural rules promulgated by the code reviser now codified in the Washington Administrative Code, as WAC 1-08-005 through 1-08-590, as now or hereinafter amended, subject to any additional rules the council may add from time to time. The council reserves the right to make whatever determination is fair and equitable should any question not covered by its rules come before the council, said determination to be in accordance with the spirit and intent of the law.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348, 90-02-108, § 51-08-010, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-08-010, filed 9/1/76.]

## Chapter 51-11 WAC

### WASHINGTON STATE ENERGY CODE 2006 EDITION

#### WAC

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#### REFERENCE STANDARD 29: NONRESIDENTIAL BUILDING DESIGN BY SYSTEMS ANALYSIS

51-11-99901	Section 1—Scope.
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51-11-99904	Section 4—Suggested software for systems analysis approach.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

51-11-0606	Reserved. [Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-0606, filed 10/18/93, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0606, filed 12/19/90, effective 7/1/91.] Repealed by 98-03-003, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025 and 19.27A.045.
51-11-0607	Reserved. [Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-0607, filed 10/18/93, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0607, filed 12/19/90, effective 7/1/91.] Repealed by 98-03-003, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025 and 19.27A.045.
51-11-0608	Reserved. [Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-0608, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW, 92-01-140, § 51-11-0608, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0608, filed 12/19/90, effective 7/1/91.] Repealed by 98-03-003, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025 and 19.27A.045.
51-11-0626	Table 6-2—Reserved. [Statutory Authority: RCW 19.27A.025, 19.27A.045, 02-01-112, § 51-11-0626, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0626, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0626, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226, 95-01-126, § 51-11-0626, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW, 94-05-059, § 51-11-0626, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW, 92-01-140, § 51-11-0626, filed 12/19/91, effective 7/1/92.] Repealed by 07-01-089, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW.
51-11-0627	Table 6-3—Reserved. [Statutory Authority: RCW 19.27A.025, 19.27A.045, 02-01-112, § 51-11-0627, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0627, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0627, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226, 95-01-126, § 51-11-0627, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW, 94-05-059, § 51-11-0627, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW, 92-01-140, § 51-11-0627, filed 12/19/91, effective 7/1/92.] Repealed by 07-01-089, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW.
51-11-0628	Table 6-4—Reserved. [Statutory Authority: RCW 19.27A.025, 19.27A.045, 02-01-112, § 51-11-0628, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0628, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0628, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226, 95-01-126, § 51-11-0628, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW, 94-05-059, § 51-11-0628, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW, 92-01-140, § 51-11-0628, filed 12/19/91, effective 7/1/92.] Repealed by 07-01-089, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW.
51-11-0629	Table 6-5—Reserved. [Statutory Authority: RCW 19.27A.025, 19.27A.045, 02-01-112, § 51-11-0629, filed 12/18/01, effective 7/1/02; 98-03-003, § 51-11-0629, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226, 95-01-126, § 51-11-0629, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW, 94-05-059, § 51-11-0629, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW, 92-01-140, § 51-11-0629, filed 12/19/91, effective 7/1/92.] Repealed by 07-01-089, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW.
51-11-0630	Table 6-6—Reserved. [Statutory Authority: RCW 19.27A.025, 19.27A.045, 02-01-112, § 51-11-0630, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-



- 0630, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0630, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226. 95-01-126, § 51-11-0630, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0630, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0630, filed 12/19/91, effective 7/1/92.] Repealed by 07-01-089, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW.
- 51-11-0631 Table 6-7—Reserved. [Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0631, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0631, filed 12/19/91, effective 7/1/92.] Repealed by 07-01-089, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW.
- 51-11-1010 Section 1009 Mass. [Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1010, filed 12/19/90, effective 7/1/91.] Repealed by 98-03-003, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025 and 19.27A.045.
- 51-11-1201 Scope. [Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1201, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.
- 51-11-1210 Application of terms. [Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-1210, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27.074, 19.27A.020 and 19.27A.025. 97-03-017, § 51-11-1210, filed 1/7/97, effective 7/1/97. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1210, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.
- 51-11-1701 Scope. [Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-1701, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1701, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.
- 51-11-2000 Default heat-loss coefficients. [Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-2000, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.
- 51-11-2001 General. [Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-2001, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.
- 51-11-2002 Below grade walls and slabs. [Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-2002, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.
- 51-11-2003 On-grade slab floors. [Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-2003, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.
- 51-11-2004 Floors over unconditioned space. [Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-2004, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.
- 51-11-2005 Above grade walls. [Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-2005, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-2005, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.
- 51-11-2006 Default U-factors for glazing and doors. [Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-2006, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-2006, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.
- 51-11-2007 Ceilings. [Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-2007, filed 1/8/98,

effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-2007, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.

51-11-2008

Reserved. [Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-2008, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.

51-11-2009

Mass. [Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-2009, filed 10/18/93, effective 4/1/94.] Repealed by 01-03-010, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 19.27A.045.

## **WAC 51-11-0100 Chapter 1—Administration and enforcement.**

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0100, filed 12/19/90, effective 7/1/91.]

## **WAC 51-11-0101 Section 101—Scope and general requirements.**

101.1 Title: Chapters 1 through 10 of this Code shall be known as the "Washington State Residential Energy Code" and may be cited as such; and will be referred to herein as "this Code."

101.2 Purpose and Intent: The purpose of this Code is to provide minimum standards for new or altered buildings and structures or portions thereof to achieve efficient use and conservation of energy.

The purpose of this Code is not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefitted by the terms of this Code.

It is intended that these provisions provide flexibility to permit the use of innovative approaches and techniques to achieve efficient use and conservation of energy. These provisions are structured to permit compliance with the intent of this Code by any one of the following three paths of design:

1. A systems analysis approach for the entire building and its energy-using sub-systems which may utilize renewable energy sources, Chapter 4.

2. A component performance approach for various building elements and mechanical systems and components, Chapter 5.

3. A prescriptive requirements approach, Chapter 6.

Compliance with any one of these approaches meets the intent of this Code. This Code is not intended to abridge any safety or health requirements required under any other applicable codes or ordinances.

The provisions of this Code do not consider the efficiency of various energy forms as they are delivered to the building envelope. A determination of delivered energy efficiencies in conjunction with this Code will provide the most efficient use of available energy in new building construction.

101.3 Scope: This Code sets forth minimum requirements for the design of new buildings and structures that provide facilities or shelter for residential occupancies by regulating their exterior envelopes and the selection of their

HVAC, service water heating systems and equipment for efficient use and conservation of energy.

Buildings shall be designed to comply with the requirements of either Chapter 4, 5, or 6 of this Code.

For the purposes of this Code:

Detached one- and two-family dwellings built under the International Residential Code shall be considered R-3 Occupancies.

Attached multiple single-family dwellings (townhouses) built under the International Residential Code shall be considered R-2 Occupancies.

**101.3.1 Exempt Buildings:** Buildings and structures or portions thereof meeting any of the following criteria shall be exempt from the building envelope requirements of sections 502 and 602, but shall comply with all other requirements for building mechanical systems, and service water heating.

**101.3.1.1:** Buildings and structures or portions thereof whose peak design rate of energy usage is less than three and four tenths (3.4) Btu/h per square foot or one point zero (1.0) watt per square foot of floor area for space conditioning requirements.

**101.3.1.2:** Buildings and structures or portions thereof which are neither heated according to the definition of heated space in Chapter 2, nor cooled by a nonrenewable energy source, provided that the nonrenewable energy use for space conditioning complies with requirements of section 101.3.1.1.

**101.3.1.3:** Greenhouses isolated from any conditioned space and not intended for occupancy.

**101.3.1.4:** The provisions of this code do not apply to the construction, alteration, or repair of temporary worker housing except as provided by rule adopted under chapter 70.114A RCW or chapter 37, Laws of 1998 (SB 6168). "Temporary worker housing" means a place, area, or piece of land where sleeping places or housing sites are provided by an employer for his or her employees or by another person, including a temporary worker housing operator, who is providing such accommodations for employees, for temporary, seasonal occupancy, and includes "labor camps" under RCW 70.54.110.

**101.3.2 Application to Existing Buildings:** Additions, historic buildings, changes of occupancy or use, and alterations or repairs shall comply with the requirements in the subsections below.

**EXCEPTION:** The building official may approve designs of alterations or repairs which do not fully conform with all of the requirements of this Code where in the opinion of the building official full compliance is physically impossible and/or economically impractical and:

1. The alteration or repair improves the energy efficiency of the building; or
2. The alteration or repair is energy efficient and is necessary for the health, safety, and welfare of the general public.

In no case, shall building envelope requirements or mechanical system requirements be less than those requirements in effect at the time of the initial construction of the building.

**101.3.2.1 Additions to Existing Buildings:** Additions to existing buildings or structures may be made to such buildings or structures without making the entire building or structure comply, provided that the new additions shall conform to the provisions of this Code.

**EXCEPTION:** New additions which do not fully comply with the requirements of this Code and which have a floor area which is less than seven hundred fifty square feet shall be approved provided that improvements are made to the existing occupancy to compensate for any deficiencies in the new addition. Compliance shall be demonstrated by either systems analysis or component performance calculations. The nonconforming addition and upgraded, existing occupancy shall have an energy budget or Target UA which is less than or equal to the unimproved existing building (minus any elements which are no longer part of the building envelope once the addition is added), with the addition designed to comply with this Code.

**101.3.2.2 Historic Buildings:** The building official may modify the specific requirements of this Code for historic buildings and require in lieu thereof alternate requirements which will result in a reasonable degree of energy efficiency. This modification may be allowed for those buildings which have been specifically designated as historically significant by the state or local governing body, or listed in The National Register of Historic Places or which have been determined to be eligible for listing.

**101.3.2.3 Change of Occupancy or Use:**

Any Other than Group R Occupancy which is converted to Group R Occupancy shall be brought into full compliance with this Code.

**101.3.2.4 Alterations and Repairs:** All alterations and repairs to buildings or portions thereof originally constructed subject to the requirements of this Code shall conform to the provisions of this Code without exception. For all other existing buildings, initial tenant alterations shall comply with the new construction requirements of this Code. Other alterations and repairs may be made to existing buildings and moved buildings without making the entire building comply with all of the requirements of this Code for new buildings, provided the following requirements are met:

**101.3.2.5 Building Envelope:** The result of the alterations or repairs both:

1. Improves the energy efficiency of the building, and
2. Complies with the overall average thermal transmittance values of the elements of the exterior building envelope in Table 5-1 of Chapter 5 or the nominal R-values and glazing requirements of the reference case in Tables 6-1 and 6-2.

**EXCEPTIONS:**

1. Untested storm windows may be installed over existing glazing for an assumed U-factor of 0.90, however, where glass and sash are being replaced in Group R Occupancy, glazing shall comply with the appropriate reference case in Table 6-1 and 6-2.
2. Where the structural elements of the altered portions of roof/ceiling, wall or floor are not being replaced, these elements shall be deemed to comply with this Code if all existing framing cavities which are exposed during construction are filled to the full depth with batt insulation or insulation having an equivalent nominal R-value while, for roof/ceilings, maintaining the required space for ventilation. Existing walls and floors without framing cavities need not

be insulated. Existing roofs shall be insulated to the requirements of this Code if

- a. The roof is uninsulated or insulation is removed to the level of the sheathing, or
- b. All insulation in the roof/ceiling was previously installed exterior to the sheathing or nonexistent.

**101.3.2.6 Building Mechanical Systems:** Those parts of systems which are altered or replaced shall comply with section 503 of this Code.

**101.3.2.7 Service Water Heating:** Those parts of systems which are altered or replaced shall comply with section 504.

**101.3.2.8 Lighting:** Alterations shall comply with section 1132.3.

**EXCEPTION:** Group R-3 and R-4 Occupancy and the dwelling unit portions of Group R-1 and R-2 Occupancy.

**101.3.3 Mixed Occupancy:** When a building houses more than one occupancy, each portion of the building shall conform to the requirements for the occupancy housed therein. Where approved by the building official, where minor accessory uses do not occupy more than ten percent of the area of any floor of a building, the major use may be considered the building occupancy.

**101.4 Amendments by Local Government:** Except as provided in RCW 19.27A.020(7), this Code shall be the maximum and minimum energy code for Group R Occupancy in each town, city and county, no later than July 1, 1991.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0101, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0101, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-0101, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27.031 and 19.27.074. 98-24-078, § 51-11-0101, filed 12/1/98, effective 7/1/99. Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0101, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0101, filed 10/18/93, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0101, filed 12/19/90, effective 7/1/91.]

## **WAC 51-11-0102 Materials and equipment.**

**102.1 Identification:** All materials and equipment shall be identified in order to show compliance with this Code.

**102.2 Maintenance Information:** Required regular maintenance actions shall be clearly stated and incorporated on a readily accessible label. Such label may be limited to identifying, by title or publication number, the operation and maintenance manual for that particular model and type of product. Maintenance instructions shall be furnished for any equipment which requires preventive maintenance for efficient operation.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0102, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0103 Alternate materials—Method of construction, design or insulating systems.** The provisions of this Code are not intended to prevent the use of any material, method of construction, design or insulating system not specifically prescribed herein, provided that such construction, design or insulating system has been approved by the building official as meeting the intent of this Code. The

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building official may approve any such alternate provided he finds the proposed alternate meets or exceeds the provisions of this Code and that the material, method, design or work offered is for the purpose intended, at least the equivalent of that prescribed in this Code, in quality, strength, effectiveness, fire-resistance, durability, safety, and efficient use and conservation of energy. The building official may require that sufficient evidence of proof be submitted to substantiate any claims that may be made regarding performance capabilities.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0103, filed 12/19/90, effective 7/1/91.]

## **WAC 51-11-0104 Plans and specifications.**

**104.1 General:** If required by the building official, plans and specifications shall be submitted in support of an application for a building permit. If required by the building official, plans and specifications shall be stamped and authenticated by a registered design professional currently licensed in the state of Washington. If required by the building official, all energy calculations submitted under the provisions of Chapter 4 for Other than Group R Occupancy shall be stamped and authenticated by an engineer or architect licensed to practice by the state. All plans and specifications, together with supporting data, shall be submitted to the building official prior to issuance of a building permit.

**104.2 Details:** The plans and specifications shall show in sufficient detail all pertinent data and features of the building and the equipment and systems as herein governed including, but not limited to: Design criteria, exterior envelope component materials, U-factors of the envelope systems, R-values of insulating materials, size and type of apparatus and equipment, equipment and systems controls and other pertinent data to indicate compliance with the requirements of this Code.

The building official may accept the professional stamp of an architect or engineer licensed to do business by the state in lieu of a plan and specification check if the engineer or architect stipulates to the best of his knowledge, understanding and belief, the design meets the requirements of this Code.

[Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0104, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0104, filed 12/19/90, effective 7/1/91.]

## **WAC 51-11-0105 Inspections and enforcement.**

**105.1 General:** All construction or work for which a permit is required shall be subject to inspection by the building official and all such construction or work shall remain accessible and exposed for inspection purposes until approved by the building official.

**105.2 Approvals Required:** No work shall be done on any part of the building or structure beyond the point indicated in each successive inspection without first obtaining the approval of the building official.

**105.2.1 Required Inspections:** The building official, upon notification, shall make the following inspection in

addition to those inspections required in section 109.3 of the International Building Code:

1. Wall insulation inspection: To be made after all wall insulation and air vapor retarder sheet or film materials are in place, but before any wall covering is placed.

105.3 Reinspection: The building official may require a structure to be reinspected.

[Statutory Authority: RCW 19.27A.020, 19.27A.045, 04-01-106, § 51-11-0105, filed 12/17/03, effective 7/1/04. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226, 95-01-126, § 51-11-0105, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0105, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0106 Violations.** It shall be unlawful for any person, firm, or corporation to erect or construct any building, or remodel or rehabilitate any existing building or structure in the state, or allow the same to be done, contrary to or in violation of any of the provisions of this Code.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0106, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0107 Liability.** Nothing contained in this Code is intended to be nor shall be construed to create or form the basis for any liability on the part of any city or county or its officers, employees or agents for any injury or damage resulting from the failure of a building to conform to the provisions of this Code.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0107, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0108 Conflicts with other codes.** In addition to the requirements of this Code, all occupancies shall conform to the provisions included in the State Building Code (chapter 19.27 RCW). In case of conflicts among codes enumerated in RCW 19.27.031 (1), (2), (3), and (4) and this Code, the first named code shall govern over the following. Provided, in the case of conflict between the duct insulation requirements of this Code and the duct sealing and insulation requirements of Section 603 and 604 of the State Mechanical Code (chapter 51-52 WAC), the duct insulation requirements of this Code, or where applicable, a local jurisdiction's energy code shall govern.

Where, in any specific case, different sections of this Code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable. Wherever in this Code reference is made to the appendix, the provisions in the appendix shall not apply unless specifically adopted.

[Statutory Authority: RCW 19.27A.020, 19.27A.045, 04-01-106, § 51-11-0108, filed 12/17/03, effective 7/1/04; 02-24-076, § 51-11-0108, filed 12/4/02, effective 5/1/03. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226, 95-01-126, § 51-11-0108, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0108, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0109 Severability.** If any provision of this Code or its application to any person or circumstance is held invalid, the remainder of this Code or the application of the provision to other persons or circumstances is not affected.

[Title 51 WAC—p. 36]

[Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0109, filed 12/19/90, effective 7/1/91.]

## **WAC 51-11-0200 Chapter 2—Definitions.**

[Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0200, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0201 Scope.** The following definitions shall apply to chapters 1 through 20.

**201.1 Application of Terms:** For the purposes of this Code, certain abbreviations, terms, phrases, words and their derivatives, shall be as set forth in this chapter. Where terms are not defined, they shall have their ordinary accepted meanings within the context with which they are used. In the event there is a question about the definition of a term, the definitions for terms in the codes enumerated in RCW 19.27.031 and the edition of Webster's dictionary referenced therein shall be considered as the sources for providing ordinarily accepted meanings.

**Addition:** See the Washington State Building Code.

**Advanced framed ceiling:** Advanced framing assumes full and even depth of insulation extending to the outside edge of exterior walls. (See Standard Framing and Section 1007.2 of this Code.)

**Advanced framed walls:** Studs framed on twenty-four inch centers with double top plate and single bottom plate. Corners use two studs or other means of fully insulating corners, and one stud is used to support each header. Headers consist of double 2X material with R-10 insulation between the header and exterior sheathing. Interior partition wall/exterior wall intersections are fully insulated in the exterior wall. (See Standard Framing and Section 1005.2 of this Code.)

**AFUE. Annual fuel utilization efficiency:** Unlike steady state conditions, this rating is based on average usage including on and off cycling as set out in the standardized Department of Energy Test Procedures.

**Air conditioning, comfort:** The process of treating air to control simultaneously its temperature, humidity, cleanliness and distribution to meet requirements of the conditioned space.

**ARI:** Air-Conditioning and Refrigeration Institute.

**ASHRAE:** American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.

**ASTM:** American Society for Testing and Materials

**Automatic:** Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for example, a change in current strength, pressure, temperature or mechanical configuration. (See **Manual**.)

**Below grade walls:** Walls or the portion of walls which are entirely below the finish grade or which extend two feet or less above the finish grade.

**Boiler capacity:** The rate of heat output in Btu/h measured at the boiler outlet, at the design inlet and outlet conditions and rated fuel/energy input.

**Building envelope:** For Group R Occupancy, the elements of a building which enclose conditioned spaces through which thermal energy may be transferred to or from the exterior or to or from spaces exempted by the provisions of Section 101.3.1. For other than Group R Occupancy, the

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elements of a building which enclose conditioned spaces through which thermal energy may be transferred to or from the exterior, or to or from unconditioned spaces, or to or from semi-heated spaces, or to or from spaces exempted by the provisions of Section 1301.

**Building, existing:** See the Washington State Building Code.

**Building official:** The official authorized to act in behalf of a jurisdiction code enforcement agency or its authorized representative.

**Building project:** A building or group of buildings, including on-site energy conversion or electric-generating facilities, which utilize a single submittal for a construction permit or are within the boundary of a contiguous area under one ownership.

**Conditioned floor area:** (See Gross conditioned floor area.)

**Conditioned space:** A cooled space, heated space (fully heated), heated space (semi-heated) or indirectly conditioned space.

**Cooled space:** An enclosed space within a building that is cooled by a cooling system whose sensible capacity

- a. Exceeds 5 Btu/(h·ft<sup>2</sup>), or
- b. Is capable of maintaining space dry bulb temperature of 90°F or less at design cooling conditions.

**COP - Coefficient of performance:** The ratio of the rate of net heat output (heating mode) or heat removal (cooling mode) to the rate of total on-site energy input to the heat pump, expressed in consistent units and under designated rating conditions. (See Net Heat Output, Net Heat Removal, Total On-Site Energy Input.)

**Daylighted zone:**

a. Under overhead glazing: The area under overhead glazing whose horizontal dimension, in each direction, is equal to the overhead glazing dimension in that direction plus either the floor to ceiling height or the dimension to a ceiling height opaque partition, or one-half the distance to adjacent overhead or vertical glazing, whichever is least.

b. At vertical glazing: The area adjacent to vertical glazing which receives daylighting from the glazing. For purposes of this definition and unless more detailed daylighting analysis is provided, the daylighting zone depth is assumed to extend into the space a distance of 15 feet or to the nearest ceiling height opaque partition, whichever is less. The daylighting zone width is assumed to be the width of the window plus either two feet on each side (the distance to an opaque partition) or one-half the distance to adjacent overhead or vertical glazing, whichever is least.

**Daylight sensing control (DS):** A device that automatically regulates the power input to electric lighting near the glazing to maintain the desired workplace illumination, thus taking advantage of direct or indirect sunlight.

**Deadband:** The temperature range in which no heating or cooling is used.

**Demand control ventilation (DCV):** A ventilation system capability that provides for the automatic reduction of outdoor air intake below design rates when the actual occupancy of spaces served by the system is less than design occupancy.

**Design cooling conditions:** The cooling outdoor design temperature from the 0.5% column for summer from the

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Puget Sound Chapter of ASHRAE publication "Recommended Outdoor Design Temperatures, Washington State, ASHRAE."

**Design heating conditions:** The heating outdoor design temperature from the 0.6% column for winter from the Puget Sound Chapter of ASHRAE publication "Recommended Outdoor Design Temperatures, Washington State, ASHRAE."

**Door:** All operable opening areas, which are not glazing, in the building envelope including swinging and roll-up doors, fire doors, smoke vents and access hatches.

**Door area:** Total area of door measured using the rough opening and including the door and frame.

**Dwelling unit:** See the Washington State Building Code.

**Economizer, air:** A ducting arrangement and automatic control system that allows a cooling supply fan system to supply outside air to reduce or eliminate the need for mechanical refrigeration during mild or cold weather.

**Economizer, water:** A system by which the supply air of a cooling system is cooled directly, indirectly or both, by evaporation of water or by other appropriate fluid in order to reduce or eliminate the need for mechanical refrigeration.

**EER. Energy efficiency ratio:** The ratio of net equipment cooling capacity in Btu/h to total rate of electric input in watts under designated operating conditions.

**Efficiency, HVAC system:** The ratio of useful energy (at the point of use) to the energy input for a designated time period, expressed in percent.

**Emissivity:** The ability to absorb infrared radiation. A low emissivity implies a higher reflectance of infrared radiation.

**Energy:** The capacity for doing work; taking a number of forms which may be transformed from one into another, such as thermal (heat), mechanical (work), electrical and chemical; in customary units, measured in kilowatt-hours (kWh) or British thermal units (Btu). (See **New energy**.)

**Energy, recovered:** (See **Recovered energy**.)

**Exterior envelope:** (See **Building envelope**.)

**F-Factor:** The perimeter heat loss factor expressed in Btu/hr·ft·°F.

**F-Value:** (See **F-Factor**.)

**Facade area:** Vertical projected area including nonhorizontal roof area, overhangs, cornices, etc. measured in elevation in a vertical plane parallel to the plane of the building face.

**Floor over unconditioned space:** A floor which separates a conditioned space from an unconditioned space which is buffered from exterior ambient conditions including vented crawl spaces and unconditioned basements or other similar spaces, or exposed to exterior ambient conditions including open parking garages and enclosed garages which are mechanically ventilated.

**Garden window:** A multisided glazing product that projects beyond the plane of the wall.

**Glazed wall system:** A category of site assembled fenestration products used in the NFRC 100 and NFRC 200 rating procedures that include curtainwalls.

**Glazing:** All areas, including the frames, in the shell of a conditioned space that let in natural light including win-

dows, clerestories, skylights, sliding or swinging glass doors and glass block walls.

**Glazing area:** Total area of the glazing measured using the rough opening, and including the glazing, sash, and frame. For doors where the daylight opening area is less than 50% of the door area, the glazing area is the daylight opening area. For all other doors, the glazing area is the door area.

**Gross conditioned floor area:** The horizontal projection of that portion of interior space which is contained within exterior walls and which is conditioned directly or indirectly by an energy-using system, and which has an average height of five feet or greater, measured from the exterior faces.

**Gross exterior wall area:** The normal projection of the building envelope wall area bounding interior space which is conditioned by an energy-using system and which separates conditioned space from: Unconditioned space, or semi-heated space, or exterior ambient conditions or earth; includes opaque wall, vertical glazing and door areas. The gross area of walls consists of all opaque wall areas, including foundation walls, between floor spandrels, peripheral edges of floors, vertical glazing areas and door areas, where such surfaces are exposed to exterior ambient conditions and enclose a conditioned space including interstitial areas between two such spaces. The area of the wall is measured from the top of the floor insulation to the bottom of the roof insulation. (See Below grade wall.)

**Gross floor area:** The sum of the areas of the several floors of the building, including basements, cellars, mezzanine and intermediate floored tiers and penthouses of headroom height, measured from the exterior faces of exterior walls or from the center line of walls separating buildings, but excluding: Covered walkways, open roofed-over areas, porches and similar spaces. Pipe trenches, exterior terraces or steps, chimneys, roof overhangs and similar features.

**Gross roof/ceiling area:** A roof/ceiling assembly shall be considered as all components of the roof/ceiling envelope through which heat flows, thus creating a building transmission heat loss or gain, where such assembly is exposed to exterior ambient conditions and encloses a conditioned space. The assembly does not include those components that are separated from a heated and/or cooled space by a vented airspace. The gross area of a roof/ceiling assembly consists of the total interior surface of such assembly, including over-head glazing.

**Guest room:** See the Washington State Building Code.

**Heat:** The form of energy that is transferred by virtue of a temperature difference.

**Heat storage capacity:** The physical property of materials (mass) located inside the building envelope to absorb, store, and release heat.

**Heated space (Fully heated):** An enclosed space within a building, including adjacent connected spaces separated by an uninsulated component (e.g., basements, utility rooms, garages, corridors), which is heated by a heating system whose output capacity is

- a. Capable of maintaining a space dry-bulb temperature of 45°F or greater at design heating conditions; or
- b. 8 Btu/(h·ft<sup>2</sup>) or greater in Climate Zone 1 and 12 Btu/(h·ft<sup>2</sup>) or greater in Climate Zone 2.

**Heated space (Semi-heated):** An enclosed space within a building, including adjacent connected spaces separated by an uninsulated component (e.g., basements, utility rooms, garages, corridors), which is heated by a heating system

rated by an uninsulated component (e.g., basements, utility rooms, garages, corridors), which is heated by a heating system

- a. Whose output capacity is 3 Btu/(h·ft<sup>2</sup>) or greater in Climate Zone 1 and 5 Btu/(h·ft<sup>2</sup>) or greater in Climate Zone 2; and

- b. Is not a Heated Space (Fully Heated).

**High efficacy luminaire:** A lighting fixture that does not contain a medium screw base socket (E24/E26) and whose lamps have a minimum efficiency of:

- a. 60 lumens per watt for lamps over 40 watts;
- b. 50 lumens per watt for lamps over 15 watts to 40 watts;
- c. 40 lumens per watt for lamps 15 watts or less.

**HSPF. Heating season performance factor:** The total heating output (in Btu) of a heat pump during its normal annual usage period for heating divided by the total (watt hour) electric power input during the same period, as determined by test procedures consistent with the U.S. Department of Energy "Test Procedure for Central Air Conditioners, Including Heat Pumps" published in Standard RS-30. When specified in Btu per watt hour an HSPF of 6.826 is equivalent to a COP of 2.0.

**Humidistat:** A regulatory device, actuated by changes in humidity, used for automatic control of relative humidity.

**HVAC:** Heating, ventilating and air conditioning.

**HVAC system components:** HVAC system components provide, in one or more factory-assembled packages, means for chilling and/or heating water with controlled temperature for delivery to terminal units serving the conditioned spaces of the buildings. Types of HVAC system components include, but are not limited to, water chiller packages, reciprocating condensing units and water source (hydronic) heat pumps. (See **HVAC system equipment**.)

**HVAC system efficiency:** (See **Efficiency, HVAC system**.)

**HVAC system equipment:** HVAC system equipment provides, in one (single package) or more (split system) factory-assembled packages, means for air circulation, air cleaning, air cooling with controlled temperature and dehumidification; and optionally, either alone or in combination with a heating plant, the functions of heating and humidifying. The cooling function may be either electrically or heat operated and the refrigerant condenser may be air, water or evaporatively cooled. Where the equipment is provided in more than one package, the separate packages shall be designed by the manufacturer to be used together. The equipment may provide the heating function as a heat pump or by the use of electric elements. (The word "equipment" used without modifying adjective may, in accordance with common industry usage, apply either to HVAC system equipment or HVAC system components.)

**Indirectly conditioned space:** An enclosed space within a building that is not a heated or cooled space, whose area weighted heat transfer coefficient to heated or cooled spaces exceeds that to the outdoors or to unconditioned spaces; or through which air from heated or cooled spaces is transferred at a rate exceeding three air changes per hour. Enclosed corridors between conditioned spaces shall be considered as indirectly conditioned space. (See **Heated Space, Cooled Space and Unconditioned Space**.)

**Infiltration:** The uncontrolled inward air leakage through cracks and interstices in any building element and around windows and doors of a building caused by the pressure effects of wind and/or the effect of differences in the indoor and outdoor air density.

**Insulation baffle:** A rigid material, resistant to wind driven moisture, the purpose of which is to allow air to flow freely into the attic or crawl space and to prevent insulation from blocking the ventilation of these spaces, or the loss of insulation. Example materials for this purpose are sheet metal, or wax impregnated cardboard.

**Insulation position:**

a. **Exterior Insulation Position:** A wall having all or nearly all of its mass exposed to the room air with the insulation on the exterior of the mass.

b. **Integral Insulation Position:** A wall having mass exposed to both room and outside air, with substantially equal amounts of mass on the inside and outside of the insulation layer.

c. **Interior Insulation Position:** A wall not meeting either of the above definitions; particularly a wall having most of its mass external to the insulation layer.

**International Building Code (IBC):** (See Washington State Building Code.)

**International Mechanical Code (IMC):** (See Washington State Building Code.)

**IPLV—Integrated part-load value:** A single number figure of merit based on part-load EER or COP expressing part-load efficiency for air conditioning and heat pump equipment on the basis of weighted operation at various load capacities for the equipment as specified in the Air-Conditioning and Refrigeration Institute (ARI) and Cooling Tower Institute (CTI) procedures.

**Luminaire:** A complete lighting unit consisting of a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the electric power supply.

**Manual:** Capable of being operated by personal intervention. (See **Automatic**.)

**Microcell:** A wireless communication facility consisting of an antenna that is either: (a) Four (4) feet in height and with an area of not more than 580 square inches; or (b) if a tubular antenna, no more than four (4) inches in diameter and no more than six (6) feet in length; and the associated equipment cabinet that is six (6) feet or less in height and no more than 48 square feet in floor area.

**NFPA:** National Fire Protection Association.

**NFRC:** National Fenestration Rating Council.

**Net heat output:** The change in the total heat content of the air entering and leaving the equipment (not including supplementary heat and heat from boilers).

**Net heat removal:** The total difference in heat content of the air entering and leaving the equipment (without heat) or the difference in total heat content of the water or refrigerant entering and leaving the component.

**New energy:** Energy, other than recovered energy, utilized for the purpose of heating or cooling. (See **energy**.)

**Nominal R-value:** The thermal resistance of insulation alone as determined in accordance with the U.S. Federal Trade Commission R-value rule (CFR Title 16, Part 460) in units of  $h \cdot ft^2 \cdot ^\circ F/Btu$  at a mean temperature of 75°F. Nomi-

nal R-value refers to the thermal resistance of the added insulation in framing cavities or insulated sheathing only and does not include the thermal resistance of other building materials or air films.

**Nonrenewable energy sources:** All energy sources that are not renewable energy sources including natural gas, oil, coal, wood, liquified petroleum gas, steam, and any utility-supplied electricity.

**Nonresidential:** All buildings and spaces in the International Building Code (IBC) occupancies other than Group R.

**Occupancy:** See the Washington State Building Code.

**Occupancy sensor:** A device that detects occupants within an area, causing any combination of lighting, equipment or appliances to be turned on or shut off.

**Opaque envelope areas:** All exposed areas of a building envelope which enclose conditioned space, except openings for doors, glazing and building service systems.

**Open blown:** Loose fill insulation pneumatically installed in an unconfined attic space.

**Outdoor air (outside air):** Air taken from the outdoors and, therefore, not previously circulated through a building.

**Overhead glazing:** A glazing surface that has a slope of less than 60° from the horizontal plane.

**Packaged terminal air conditioner:** A factory-selected combination of heating and cooling components, assemblies or sections intended to serve a room or zone. (For the complete technical definition, see Standard RS-5.)

**Permeance (perm):** The ability of a material of specified thickness to transmit moisture in terms of amount of moisture transmitted per unit time for a specified area and differential pressure (grains per hour  $\cdot ft^2 \cdot inches$  of HG). Permeance may be measured using ASTM E-96-00 or other approved dry cup method as specified in RS-1.

**Personal wireless service facility:** A Wireless Communication Facility (WCF), including a microcell, which is a facility for the transmission and/or reception of radio frequency signals and which may include antennas, equipment shelter or cabinet, transmission cables, a support structure to achieve the necessary elevation, and reception and/or transmission devices or antennas.

**Pool cover:** A vapor-retardant cover which lies on or at the surface of the pool.

**Power:** In connection with machines, the time rate of doing work. In connection with the transmission of energy of all types, the rate at which energy is transmitted; in customary units, it is measured in watts (W) or British Thermal Units per hour (Btu/h).

**Process energy:** Energy consumed in support of a manufacturing, industrial, or commercial process other than the maintenance of building comfort or amenities for building occupants.

**Radiant slab floor:** A slab floor assembly on grade or below, containing heated pipes, ducts, or electric heating cables that constitute a floor or portion thereof for complete or partial heating of the structure.

**Readily accessible:** See the Washington State Mechanical Code.

**Recooling:** The removal of heat by sensible cooling of the supply air (directly or indirectly) that has been previously heated above the temperature to which the air is to be sup-



plied to the conditioned space for proper control of the temperature of that space.

**Recovered energy:** Energy utilized which would otherwise be wasted (i.e. not contribute to a desired end use) from an energy utilization system.

**Reheat:** The application of sensible heat to supply air that has been previously cooled below the temperature of the conditioned space by either mechanical refrigeration or the introduction of outdoor air to provide cooling.

**Renewable energy sources:** Renewable energy sources of energy (excluding minerals) are derived from: (1) Incoming solar radiation, including but not limited to, natural daylighting and photosynthetic processes; (2) energy sources resulting from wind, waves and tides, lake or pond thermal differences; and (3) energy derived from the internal heat of the earth, including nocturnal thermal exchanges.

**Reset:** Adjustment of the set point of a control instrument to a higher or lower value automatically or manually to conserve energy.

**Roof/ceiling assembly:** (See Gross roof/ceiling area.)

**SEER - Seasonal Energy Efficiency Ratio:** The total cooling output of an air conditioner during its normal annual usage period, in Btu's, divided by the total electric energy input in watt-hours, during the same period, as determined by 10 CFR, Part 430.

**Semi-heated space:** Sub-category of **Heated Space**. (See **Heated Space**.)

**Sequence:** A consecutive series of operations.

**Service systems:** All energy-using systems in a building that are operated to provide services for the occupants or processes housed therein, including HVAC, service water heating, illumination, transportation, cooking or food preparation, laundering or similar functions.

**Service water heating:** Supply of hot water for domestic or commercial purposes other than comfort heating.

**Shaded:** Glazed area which is externally protected from direct solar radiation by use of devices permanently affixed to the structure or by an adjacent building, topographical feature, or vegetation.

**Shading coefficient:** The ratio of solar heat gain occurring through nonopaque portions of the glazing, with or without integral shading devices, to the solar heat gain occurring through an equivalent area of unshaded, 1/8 inch thick, clear, double-strength glass.

Note: Heat gains to be compared under the same conditions. See Chapter 30 of Standard RS-1, listed in Chapter 7 of this Code.

**Shall:** Denotes a mandatory code requirement.

**Single family:** One and two family residential dwelling units with no more than two units in a single building.

**Skylight:** (See Overhead glazing.)

**Slab-below-grade:** Any portion of a slab floor in contact with the ground which is more than 24 inches below the final elevation of the nearest exterior grade.

**Slab-on-grade, exterior:** Any portion of a slab floor in contact with the ground which is less than or equal to twenty-four inches below the final elevation of the nearest exterior grade.

**Small business:** Any business entity (including a sole proprietorship, corporation, partnership, or other legal entity) which is owned and operated independently from all other

businesses, which has the purpose of making a profit, and which has fifty or fewer employees, or which has a million dollars or less per year in gross sales, of window products.

**Solar energy source:** Source of natural daylighting and of thermal, chemical or electrical energy derived directly from conversion of incident solar radiation.

**Solar heat gain coefficient (SHGC):** The ratio of the solar heat gain entering the space through the glazing product to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation which is then reradiated, conducted or convected into the space.

**Split system:** Any heat pump or air conditioning unit which is provided in more than one assembly requiring refrigeration piping installed in the field.

**Standard framing:** All framing practices not defined as "intermediate" or "advanced" shall be considered standard. (See Advanced framed ceiling, Advanced framed walls, Intermediate framed wall and Section 1005.2 of this Code.)

**Substantial contact:** A condition where adjacent building materials are placed in a manner that proximal surfaces are contiguous, being installed and supported as to eliminate voids between materials, without compressing or degrading the thermal performance of either product.

**System:** A combination of central or terminal equipment or components and/or controls, accessories, interconnecting means, and terminal devices by which energy is transformed so as to perform a specific function, such as HVAC, service water heating or illumination.

**Tapering:** Installation of a reduced level of ceiling insulation at the eaves, due to reduced clearance.

**Thermal by-pass:** An area where the envelope surrounding the conditioned space is breached, or where an ineffective application compromises the performance of a thermal or infiltration barrier, increasing the structure's energy consumption by exposing finished surfaces to ambient conditions and additional heat transfer.

**Thermal conductance (C):** Time rate of heat flow through a body (frequently per unit area) from one of its bounding surfaces to the other for a unit temperature difference between the two surfaces, under steady conditions ( $\text{Btu/hr} \cdot \text{ft}^2 \cdot ^\circ\text{F}$ ).

**Thermal resistance (R):** The reciprocal of thermal conductance ( $\text{hr} \cdot \text{ft}^2 \cdot ^\circ\text{F/Btu}$ ).

**Thermal transmittance (U):** The coefficient of heat transmission (air to air). It is the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films ( $\text{Btu/hr} \cdot \text{ft}^2 \cdot ^\circ\text{F}$ ).

**Thermal transmittance, overall ( $U_o$ ):** The overall (average) heat transmission of a gross area of the exterior building envelope ( $\text{Btu/hr} \cdot \text{ft}^2 \cdot ^\circ\text{F}$ ). The  $U_o$ -factor applies to the combined effect of the time rate of heat flows through the various parallel paths, such as glazing, doors and opaque construction areas, comprising the gross area of one or more exterior building components, such as walls, floors or roof/ceiling.

**Thermostat:** An automatic control device actuated by temperature and designed to be responsive to temperature.

**Total on-site energy input:** The combination of all the energy inputs to all elements and accessories as included in

the equipment components, including but not limited to, compressor(s), compressor sump heater(s), circulating pump(s), purge devices, fan(s), and the HVAC system component control circuit.

**Transmission coefficient:** The ratio of the solar heat gain through a glazing system to that of an unshaded single pane of double strength window glass under the same set of conditions.

**Transverse joint:** The primary connection between air distribution system fittings.

**U-factor: (See thermal transmittance.)**

**U-Value: (See U-factor.)**

**Uniform Plumbing Code (UPC):** (See Washington State Plumbing Code.)

**Unitary cooling and heating equipment:** One or more factory-made assemblies which include an evaporator or cooling coil, a compressor and condenser combination, and may include a heating function as well. Where such equipment is provided in more than one assembly, the separate assemblies shall be designed to be used together.

**Unitary heat pump:** One or more factory-made assemblies which include an indoor conditioning coil, compressor(s) and outdoor coil or refrigerant-to-water heat exchanger, including means to provide both heating and cooling functions. When such equipment is provided in more than one assembly, the separate assemblies shall be designed to be used together.

**Vapor retarder:** A layer of low moisture transmissivity material (not more than 1.0 perm dry cup) placed over the warm side (in winter) of insulation, over the exterior of below grade walls, and under floors as ground cover to limit the transport of water and water vapor through exterior walls, ceilings, and floors. Vapor retarding paint, listed for this application, also meets this definition.

**Vaulted ceilings:** All ceilings where enclosed joist or rafter space is formed by ceilings applied directly to the underside of roof joists or rafters.

**Ventilation:** The process of supplying or removing air by natural or mechanical means to or from any space. Such air may or may not have been conditioned.

**Ventilation air:** That portion of supply air which comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

**Vertical glazing:** A glazing surface that has a slope of 60° or greater from the horizontal plane.

**Walls (exterior):** Any member or group of members which defines the exterior boundaries or courts of a building and which have a slope of sixty degrees or greater with the horizontal plane, and separates conditioned from unconditioned space. Band joists between floors are to be considered a part of exterior walls.

**Washington State Building Code:** The Washington State Building Code is comprised of the International Building Code; the International Residential Code; the International Mechanical Code; the International Fire Code; the Uniform Plumbing Code; the state regulations for barrier-free facilities, as designated in RCW 19.27.031; the State Energy Code; and any other codes so designated by the Washington state legislature as adopted and amended by the State Building Code Council.

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**Zone:** A space or group of spaces within a building with heating and/or cooling requirements sufficiently similar so that comfort conditions can be maintained throughout by a single controlling device. Each dwelling unit in residential buildings shall be considered a single zone.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0201, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0201, filed 12/17/03, effective 7/1/04; 02-24-076, § 51-11-0201, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-0201, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0201, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0201, filed 2/10/94, effective 4/1/94. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0201, filed 10/18/93, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0201, filed 12/19/90, effective 7/1/91.]

### WAC 51-11-0300 Chapter 3—Design conditions.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0300, filed 12/19/90, effective 7/1/91.]

### WAC 51-11-0301 Design criteria.

#### 301.1 General:

The criteria of this chapter establish the design conditions upon which the minimum thermal design requirements of the building envelope and the design of the HVAC system are to be based.

**301.2 Heating and Cooling:** A building that is designed to be both heated and cooled shall meet the more stringent of the heating or cooling requirements as required in this code when requirements of the exterior envelope differ.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0301, filed 12/19/90, effective 7/1/91.]

### WAC 51-11-0302 Thermal design parameters.

**302.1 Exterior Design Conditions:** The heating or cooling outdoor design temperatures shall be selected from 0.6 percent column for winter and 0.5 percent column for summer from the Puget Sound Chapter of ASHRAE publication "Recommended Outdoor Design Temperatures, Washington State, ASHRAE." (See also Washington State Energy Code Manual.)

#### 302.2 Interior Design Conditions:

**302.2.1 Indoor Design Temperature:** Indoor design temperature shall be seventy degrees F for heating and seventy-eight degrees F for cooling.

**EXCEPTION:** Other design temperatures may be used for equipment selection if it results in a lower energy usage.

**302.2.2 Humidification:** If humidification is provided during heating, it shall be designed for a maximum relative humidity of thirty percent. When comfort air conditioning is provided, the actual design relative humidity within the comfort envelope as defined in Standard RS-4, listed in Chapter 7, shall be selected for minimum total HVAC system energy use.

302.3 Climate Zones: All buildings shall comply with the requirements of the appropriate climate zone as defined herein.

ZONE 1: Climate Zone 1 shall include all counties not included in Climate Zone 2.

ZONE 2: Climate Zone 2 shall include: Adams, Chelan, Douglas, Ferry, Grant, Kittitas, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, and Whitman counties.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0302, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0303 Mechanical ventilation.** For all Occupancies, the minimum requirements for ventilation shall comply with the Washington State Ventilation Code and Indoor Air Quality Code. (WAC 51-13)

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0303, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0400 Chapter 4—Building design by systems analysis.**

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0400, filed 12/19/90, effective 7/1/91.]

#### **WAC 51-11-0401 Scope.**

401.1 General: This chapter establishes design criteria in terms of total energy use by a building, including all of its systems. Analysis of design for all Group R Occupancy shall comply with section 402.1 to 402.6.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0401, filed 10/18/93, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0401, filed 12/19/90, effective 7/1/91.]

#### **WAC 51-11-0402 Systems analysis.**

402.1 Special Requirements for All Group R Occupancy:

402.1.1 Energy Budgets: Proposed buildings designed in accordance with this section shall be designed to use no more energy from nonrenewable sources for space heating, and domestic hot water heating than a standard building whose enclosure elements and energy consuming systems are designed in accordance with section 502.2 of this Code for the appropriate climate zone, and heating system type and whose mechanical system type is the same as the proposed building and which complies with Section 503 of this Code. Energy derived from renewable sources may be excluded from the total annual energy consumption attributed to the alternative building.

402.1.2 Calculation of Energy Consumption: The application for a building permit shall include documentation which demonstrates, using a calculation procedure as listed in Chapter 8, or an approved alternate, that the proposed building's annual space heating energy use does not exceed the annual space heating and water heating energy use of a standard building conforming to Chapter 5 of this Code for the appropriate climate zone. The total calculated annual energy consumption shall be shown in units of kWh/ft<sup>2</sup>-yr or Btu/ft<sup>2</sup>-yr of conditioned area.

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402.1.3 Input Values: The following standardized input values shall be used in calculating annual space heating budgets:

PARAMETER	VALUE
Thermostat set point, heating	65° F
Thermostat set point, cooling	78° F
Thermostat night set back	65° F
Thermostat night set back period	0 hours
Internal gain	
R-3 and R-4 units	3000 Btu/hr
R-1 and R-2 units	1500 Btu/hr
Domestic Hot Water Heater	
Setpoint	120° F
Domestic Hot Water Consumption	20 gallons/person/day.
Minimum heat storage	Calculated using standard engineering practice for the actual building or as approved.
Site weather data	Typical meteorological year (TMY) or ersatz TMY data for the closest appropriate TMY site or other sites as approved.
Heating and cooling equipment efficiency	Equipment shall comply with Section 1411.

The standard building shall be modeled with glazing area distributed equally among the four cardinal directions. Parameter values that may be varied by the building designer to model energy saving options include, but are not limited to, the following:

1. Overall thermal transmittance,  $U_o$ , of building envelope or individual building components;
2. Heat storage capacity of building;
3. Glazing orientation; area; and solar heat coefficients; (where Chapter 5 does not contain SHGC requirements, the standard design shall be modeled with glazing SHGC as determined by Tables 13-1 and 13-2. SHGC values shall be determined in accordance with Section 1312.2.)
4. Heating system efficiency.

402.1.4 Solar Shading and Access: Building designs using passive solar features with eight percent or more south facing equivalent glazing to qualify shall provide to the building official a sun chart or other approved documentation depicting actual site shading for use in calculating compliance under this section. The building shall contain at least forty-five Btu/°F for each square foot of south facing glass.

402.1.5 Infiltration: Infiltration levels used shall be set at 0.35 air changes per hour for thermal calculation purposes only.

402.1.6 Heat Pumps: The heating season performance factor (HSPF) for heat pumps shall be calculated using procedures consistent with section 5.2 of the U.S. Department of

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Energy Test Procedure for Central Air Conditioners, including heat pumps published in the December 27, 1979 Federal Register Vol. 44, No. 24. 10 CFR 430. Climate data as specified above, the proposed buildings overall thermal performance value (Btu/°F) and the standardized input assumptions specified above shall be used to model the heat pumps HSPF.

**402.2 Energy Analysis:** Compliance with this chapter will require an analysis of the annual energy usage, hereinafter called an annual energy analysis.

**EXCEPTIONS:** Chapters 5, and 6 of this Code establish criteria for different energy-consuming and enclosure elements of the building which, will eliminate the requirement for an annual systems energy analysis while meeting the intent of this Code.

A building designed in accordance with this chapter will be deemed as complying with this Code if the calculated annual energy consumption is not greater than a similar building (defined as a "standard design") whose enclosure elements and energy-consuming systems are designed in accordance with Chapter 5.

For an alternate building design to be considered similar to a "standard design," it shall utilize the same energy source(s) for the same functions and have equal floor area and the same ratio of envelope area to floor area, environmental requirements, occupancy, climate data and usage operational schedule.

**402.3 Design:** The standard design, conforming to the criteria of Chapter 5 and the proposed alternative design shall be designed on a common basis as specified herein:

The comparison shall be expressed as kBtu or kWh input per square foot of conditioned floor area per year at the building site.

**402.4 Analysis Procedure:** The analysis of the annual energy usage of the standard and the proposed alternative building and system design shall meet the following criteria:

a. The building heating/cooling load calculation procedure used for annual energy consumption analysis shall be detailed to permit the evaluation of effect of factors specified in section 402.5.

b. The calculation procedure used to simulate the operation of the building and its service systems through a full-year operating period shall be detailed to permit the evaluation of the effect of system design, climatic factors, operational characteristics, and mechanical equipment on annual energy usage. Manufacturer's data or comparable field test data shall be used when available in the simulation of systems and equipment. The calculation procedure shall be based upon eight thousand seven hundred sixty hours of operation of the building and its service systems.

**402.5 Calculation Procedure:** The calculation procedure shall cover the following items:

a. Design requirements—Environmental requirements as required in Chapter 3.

b. Climatic data—Coincident hourly data for temperatures, solar radiation, wind and humidity of typical days in the year representing seasonal variation.

c. Building data—Orientation, size, shape, mass, air, moisture and heat transfer characteristics.

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d. Operational characteristics—Temperature, humidity, ventilation, illumination, control mode for occupied and unoccupied hours.

e. Mechanical equipment—Design capacity, part load profile.

f. Building loads—Internal heat generation, lighting, equipment, number of people during occupied and unoccupied periods.

**EXCEPTION:** Group R Occupancy shall comply with calculation procedures in Chapter 8, or an approved alternate.

**402.6 Documentation:** Proposed alternative designs, submitted as requests for exception to the standard design criteria, shall be accompanied by an energy analysis comparison report. The report shall provide technical detail on the two building and system designs and on the data used in and resulting from the comparative analysis to verify that both the analysis and the designs meet the criteria of Chapter 4 of this Code.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0402, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0402, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0402, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0402, filed 2/10/94, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0402, filed 12/19/90, effective 7/1/91.]

## **WAC 51-11-0500 Chapter 5—Building design by component performance approach.**

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0500, filed 12/19/90, effective 7/1/91.]

### **WAC 51-11-0501 Scope.**

**501.1 General:** Buildings that are heated or mechanically cooled shall be constructed so as to provide the required thermal performance of the various components. A building that is designed to be both heated and cooled shall meet the more stringent of the heating or cooling requirements as provided in this Code when requirements of the exterior envelope differ.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0501, filed 12/19/90, effective 7/1/91.]

### **WAC 51-11-0502 Building envelope requirements.**

#### **502.1 General:**

**502.1.1:** The stated U- or F-factor of any component assembly, listed in Table 5-1 or 5-2, such as roof/ceiling, opaque wall or opaque floor may be increased and the U-factor for other components decreased, provided that the total heat gain or loss for the entire building envelope does not exceed the total resulting from compliance to the U-factors specified in this section.

The U-factors for typical construction assemblies are included in Chapter 10. These values shall be used for all calculations. Where proposed construction assemblies are not represented in Chapter 10, values shall be calculated in accordance with Chapters 23-30 in Standard RS-1 listed in Chapter

7, using the framing factors listed in Chapter 10 where applicable.

For envelope assemblies containing metal framing, the U-factor shall be determined by one of the following methods:

1. Results of laboratory or field measurements.

2. Standard RS-1, listed in Chapter 7, where the metal framing is bonded on one or both sides to a metal skin or covering.

3. The zone method as provided in Chapter 25 of Standard RS-1, listed in Chapter 7.

4. Results of parallel path correction factors effective framing/cavity R-values as provided in Table 10-5A - EFFECTIVE R-VALUES FOR METAL FRAMING AND CAVITY ONLY for metal stud walls and roof/ceilings.

502.1.1.2: For consideration of thermal mass effects, see section 402.4.

502.1.1.3: When return air ceiling plenums are employed, the roof/ceiling assembly shall:

- a. For thermal transmittance purposes, not include the ceiling proper nor the plenum space as part of the assembly; and

- b. For gross area purposes, be based upon the interior face of the upper plenum surface.

502.1.4 Insulation:

502.1.4.1 General: All insulating materials shall comply with sections 2603 and/or 719 of the International Building Code. Substantial contact of the insulation with the surface being insulated is required. All insulation materials shall be installed according to the manufacturer's instructions to achieve proper densities and maintain uniform R-values and shall be installed in a manner which will permit inspection of the manufacturer's R-value identification mark. To the maximum extent possible, insulation shall extend over the full component area to the intended R-value.

Alternatively, the thickness of roof/ceiling and wall insulation that is either blown in or spray-applied shall be identified by inches of thickness, density and R-value markers installed at least one for every 300 square feet (28 m<sup>2</sup>) through the attic, ceiling and/or wall space. In attics, the markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness and minimum settled thickness with numbers a minimum 1.0 inch (25 mm) in height. Each marker shall face the attic access. The thickness of installed attic insulation shall meet or exceed the minimum initial installed thickness shown by the marker. In cathedral ceilings and walls, the markers shall be affixed to the rafter and wall frame at alternating high and low intervals and marked with the minimum installed density and R-value with numbers a minimum 1.0 inch (25 mm) in height. Each marker shall face the conditioned room area.

502.1.4.2 Insulation Materials: All insulation materials including facings such as vapor barriers or breather papers installed within floor/ceiling assemblies, roof/ceiling assem-

blies, walls, crawl spaces, or attics shall have a flame spread rating of less than 25 and a smoke density not to exceed 450 when tested in accordance with ASTM E84-01.

EXCEPTIONS:

1. Foam plastic insulation shall comply with section 2603 of the International Building Code.

2. When such materials are installed in concealed spaces of Types III, IV and V construction, the flame spread and smoke developed limitations do not apply to facing, provided that the facing is installed in substantial contact with the unexposed surface of the ceiling, floor or wall finish.

3. Cellulose insulation shall comply with section 719 of the International Building Code.

502.1.4.3 Clearances: Where required, insulation shall be installed with clearances according to manufacturer's specifications. Insulation shall be installed so that required ventilation is unobstructed. For blown or poured loose fill insulation, clearances shall be maintained through installation of a permanent retainer.

502.1.4.4 Access Hatches and Doors: Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment which prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer must be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation.

502.1.4.5 Roof/Ceiling Insulation: Open-blown or poured loose fill insulation may be used in attic spaces where the slope of the ceiling is not more than 3 feet in 12 and there is at least 30 inches of clear distance from the top of the bottom chord of the truss or ceiling joist to the underside of the sheathing at the roof ridge. When eave vents are installed, baffling of the vent openings shall be provided so as to deflect the incoming air above the surface of the insulation. Baffles shall be, rigid material, resistant to wind driven moisture. Requirements for baffles for ceiling insulation shall meet the International Building Code section 1203.2 for minimum ventilation requirements. When feasible, the baffles shall be installed from the top of the outside of the exterior wall, extending inward, to a point 6 inches vertically above the height of noncompressed insulation, and 12 inches vertically above loose fill insulation.

502.1.4.6 Wall Insulation: Insulation installed in exterior walls shall comply with the provisions of this section. All wall insulation shall fill the entire framed cavity. Exterior wall cavities isolated during framing shall be fully insulated to the levels of the surrounding walls. All faced insulation shall be face stapled to avoid compression.

EXCEPTION:

Framed cavity can be empty or partially filled provided:

1. The wall assembly calculations are performed along with a completed performance calculation for the whole building; and
2. Insulation installed in partially filled cavities is not included in the performance calculation.

**502.1.4.7 Floor Insulation:** Floor insulation shall be installed in a permanent manner in substantial contact with the surface being insulated. Insulation supports shall be installed so spacing is no more than 24 inches on center. Foundation vents shall be placed so that the top of the vent is below the lower surface of the floor insulation.

**EXCEPTION:** Insulation may be omitted from floor areas over heated basements, heated garages or underfloor areas used as HVAC supply plenums. When foundation walls are insulated, the insulation shall be attached in a permanent manner. The insulation shall not block the airflow through foundation vents when installed. When foundation vents are not placed so that the top of the vent is below the lower surface of the floor insulation, a permanently attached baffle shall be installed at an angle of 30° from horizontal, to divert air flow below the lower surface of the floor insulation.

**502.1.4.8 Slab-On-Grade:** Slab-on-grade insulation, installed inside the foundation wall, shall extend downward from the top of the slab for a minimum distance of 24 inches or downward and then horizontally beneath the slab for a minimum combined distance of 24 inches. Insulation installed outside the foundation shall extend downward to a minimum of 24 inches or to the frostline. Above grade insulation shall be protected.

**EXCEPTION:** For monolithic slabs, the insulation shall extend downward from the top of the slab to the bottom of the footing.

**502.1.4.9 Radiant Slabs:** The entire area of a radiant slab shall be thermally isolated from the soil, with a minimum of R-10 insulation. The insulation shall be an approved product for its intended use. If a soil gas control system is present below the radiant slab, which results in increased convective flow below the radiant slab, the radiant slab shall be thermally isolated from the sub-slab gravel layer.

**502.1.4.10 Below Grade Walls:** Below grade exterior wall insulation used on the exterior (cold) side of the wall shall extend from the top of the below grade wall to the top of the footing and shall be approved for below grade use. Above grade insulation shall be protected.

Insulation used on the interior (warm) side of the wall shall extend from the top of the below grade wall to the below grade floor level.

**502.1.5 Glazing and Door U-factors:** Glazing and door U-factors shall be determined in accordance with sections 502.1.5.1 and 502.1.5.2. All products shall be labeled with the NFRC certified or default U-factor. The labeled U-factor shall be used in all calculations to determine compliance with this Code. Sealed insulating glass shall conform to, or be in test for, ASTM E-774-81 class A.

**EXCEPTIONS:** 1. For glazed wall systems, assemblies with all of the following features are deemed to satisfy the vertical glazing U-factor requirement in Table 6-1 or 6-2 options with vertical glazing U-0.40 and greater:

a. Double glazing with a minimum 1/2 inch gap width, having a low-emissivity coating with  $e = 0.10$  maximum, with 90% minimum argon gas fill, and a non-aluminum spacer (as defined in footnote 1 to Table 10-6B), and

b. Frame that is thermal break aluminum (as defined in footnote 9 to Table 10-6B), wood, aluminum clad wood, vinyl, aluminum clad vinyl, or reinforced vinyl.

The only labeling requirement for products using this exception shall be a description of the product and a label stating: "This product is deemed to satisfy the Table 6-1 or 6-2 vertical glazing U-factor requirement using the exception to Section 502.1.5 in the Washington State Energy Code."

2. For overhead glazing, assemblies with all of the following features are deemed to satisfy the overhead glazing U-factor requirement in Table 6-1 or 6-2 options **except** the unlimited glazing area options (Options IV and V in Table 6-1 and Options V, VI and VII in Table 6-2):

a. Either, double glazing with a minimum 1/2 inch gap width, having a low-emissivity coating with  $e = 0.20$  maximum, with 90% minimum argon gas fill, or, triple glazed plastic domes, and

b. Frame that is thermal break aluminum (as defined in footnote 9 to Table 10-6B), wood, aluminum clad wood, vinyl, aluminum clad vinyl, or reinforced vinyl.

The only labeling requirement for products using this exception shall be a description of the product and a label stating: "This product is deemed to satisfy the Table 6-1 or 6-2 overhead glazing U-factor requirement using the exception to Section 502.1.5 in the Washington State Energy Code."

3. For solariums with a floor area which does not exceed 300 square feet, assemblies which comply with the features listed in exception 2 are deemed to satisfy the vertical glazing and overhead glazing U-factor requirement in Table 6-1 or 6-2 options with vertical glazing U-0.40 and greater.

The only labeling requirement for products using this exception shall be a description of the product and a label stating: "This product is deemed to satisfy the Table 6-1 or 6-2 vertical glazing and overhead glazing U-factor requirements using the exception to Section 502.1.5 in the Washington State Energy Code."

**502.1.5.1 Standard Procedure for Determination of Glazing U-factors:** U-factors for glazing shall be determined, certified and labeled in accordance with the National Fenestration Rating Council (NFRC) Product Certification Program (PCP), as authorized by an independent certification and inspection agency licensed by the NFRC. Compliance shall be based on the Residential Model Size. Product samples used for U-factor determinations shall be production line units or representative of units as purchased by the consumer or contractor. Products that are listed in the NFRC Certified Products Directory or certified to the NFRC standard shall not use default values.

**EXCEPTIONS:** 1. Glazing products without NFRC ratings may be assigned default U-factors from Table 10-6A for vertical glazing and from Table 10-6E for overhead glazing.

2. Units without NFRC ratings produced by a small business may be assigned default U-factors from Table 10-6A for garden windows, from Table 10-6B for other vertical glazing, and from Table 10-6E for overhead glazing.

**502.1.5.2 Standard Procedure for Determination of Door U-factors:** All doors, including fire doors, shall be assigned default U-factors from Table 10-6C.

**EXCEPTIONS:** 1. U-factors determined, certified and labeled in accordance with the National Fenestration Rating Council (NFRC) Product Certification Program (PCP), as authorized by an independent certification and inspection agency licensed by the NFRC.

2. The default values for the opaque portions of doors shall be those listed in Table 10-6C, provided that the U-factor listed for a door with a thermal break shall

only be allowed if both the door and the frame have a thermal break.

3. One unlabeled or untested exterior swinging door with the maximum area of 24 square feet may be installed for ornamental, security or architectural purposes. Products using this exception shall not be included in the U-factor calculation requirements, however glazing area shall be included in glazing area calculations.

#### 502.1.6 Moisture Control:

**502.1.6.1 Vapor Retarders:** Vapor retarders shall be installed on the warm side (in winter) of insulation as specified in the following cases.

**EXCEPTION:** Vapor retarder installed with not more than 1/3 of the nominal R-value between it and the conditioned space.

**502.1.6.2 Floors:** Floors separating conditioned space from unconditioned space shall have a vapor retarder installed. The vapor retarder shall have a one perm dry cup rating or less (i.e., four mil [0.004 inch thick] polyethylene or kraft faced material).

**502.1.6.3 Roof/Ceilings:** Roof/ceiling assemblies where the ventilation space above the insulation is less than an average of 12 inches shall be provided with a vapor retarder. Faced batt insulation where used as a vapor retarder shall be face stapled. Single rafter joist vaulted ceiling cavities shall be of sufficient depth to allow a minimum one inch vented air space above the insulation.

**502.1.6.4:** Vapor retarders shall not be required in roof/ceiling assemblies where the ventilation space above the insulation averages 12 inches or greater.

**502.1.6.5:** Vapor retarders shall not be required where all of the insulation is installed between the roof membrane and the structural roof deck.

**502.1.6.6 Walls:** Walls separating conditioned space from unconditioned space shall have a vapor retarder installed. Faced batt insulation shall be face stapled.

**EXCEPTION:** For climate zone 1, wood framed walls with a minimum of nominal R-5 continuous insulated sheathing installed outside of the framing and structural sheathing. For climate zone 2, wood framed walls with a minimum of nominal R-7.5 continuous insulated sheathing installed outside of the framing and structural sheathing. The interior cavity insulation for this exception shall be a maximum of nominal R-21.

**502.1.6.7 Ground Cover:** A ground cover of six mil (0.006 inch thick) black polyethylene or approved equal shall be laid over the ground within crawl spaces. The ground cover shall be overlapped 12 inches minimum at the joints and shall extend to the foundation wall.

**EXCEPTION:** The ground cover may be omitted in crawl spaces if the crawl space has a concrete slab floor with a minimum thickness of 3-1/2 inches.

#### 502.2 Thermal Criteria for Group R Occupancy:

**502.2.1 UA Calculations:** The proposed UA as calculated using Equations 2 and 3 shall not exceed the target UA as calculated using Equation 1. For the purpose of determining equivalent thermal performance, the glazing area for the target UA shall be calculated using values in Table 5-1. The

opaque door area shall be the same in the target UA and the proposed UA.

**EXCEPTION:** Log and solid timber walls that have a minimum average thickness of 3.5" and with space heat type other than electric resistance, are exempt from wall target UA and proposed UA calculations.

**502.2.2 Space Heat Type:** The following two categories comprise all space heating types:

1. **Electric Resistance:** Space heating systems which include baseboard units, radiant units and forced air units as either the primary or secondary heating system.

**EXCEPTION:** Electric resistance systems for which the total electric heat capacity in each individual dwelling unit does not exceed the greater of: 1) One thousand watts (1000 w) per dwelling unit, or; 2) One watt per square foot (1 w/ft<sup>2</sup>) of the gross floor area.

2. **Other:** All gas, wood, oil and propane space heating systems, unless electric resistance is used as a secondary heating system, and all heat pump space heating systems. (See EXCEPTIONS, Electric Resistance, section 502.2.2 above.)

**502.3 Reserved.**

#### 502.4 Air Leakage:

**502.4.1 General:** The requirements of this section shall apply to all buildings and structures, or portions thereof, and only to those locations separating outdoor ambient conditions from interior spaces that are heated or mechanically cooled.

**502.4.2 Doors and Windows, General:** Exterior doors and windows shall be designed to limit air leakage into or from the building envelope. Site-constructed doors and windows shall be sealed in accordance with Section 502.4.3.

#### 502.4.3 Seals and Weatherstripping:

a. Exterior joints around windows and door frames, openings between walls and foundation, between walls and roof and wall panels; openings at penetrations of utility services through walls, floors and roofs; and all other openings in the building envelope for all occupancies and all other openings in between units in R-1 and R-2 Occupancy shall be sealed, caulked, gasketed or weatherstripped to limit air leakage. Other exterior joints and seams shall be similarly treated, or taped, or covered with moisture vapor permeable housewrap.

b. All exterior doors or doors serving as access to an enclosed unheated area shall be weatherstripped to limit leakage around their perimeter when in a closed position.

c. Site built windows are exempt from testing but shall be made tight fitting. Fixed lights shall have glass retained by stops with sealant or caulking all around. Operating sash shall have weatherstripping working against overlapping trim and a closer/latch which will hold the sash closed. The window frame to framing crack shall be made tight with caulking, overlapping membrane or other approved technique.

d. Openings that are required to be fire resistive are exempt from this section.



**502.4.4 Recessed Lighting Fixtures:** When installed in the building envelope, recessed lighting fixtures shall be Type IC rated and certified under ASTM E283 to have no more than 2.0 cfm air movement from the conditioned space to the ceiling cavity. The lighting fixture shall be tested at 75 Pascals or 1.57 lbs/ft<sup>2</sup> pressure difference and have a label attached, showing compliance with this test method. Recessed lighting fixtures shall be installed with a gasket or caulk between the fixture and ceiling to prevent air leakage.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0502, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-0502, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0502, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0502, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0502, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0502, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226. 95-01-126, § 51-11-0502, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0502, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0502, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0502, filed 12/19/90, effective 7/1/91.]

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

### **WAC 51-11-0503 Building mechanical systems.**

**503.1 General:** This section covers the determination of design requirements, system and component performance, control requirements, insulating systems and duct sealing. For all other duct construction requirements, refer to the State Mechanical Code (chapter 51-42 WAC).

**503.2 Calculations of Heating and Cooling Loads, and System Sizing Limits:** The design parameters specified in Chapter 3 shall apply for all computations.

**503.2.1 Calculation Procedures:** Heating and cooling design loads for the purpose of sizing HVAC systems are required and shall be calculated in accordance with accepted engineering practice, including infiltration and ventilation.

**503.2.2 Space Heating and Space Cooling System Sizing Limits:** Building mechanical systems for all buildings which provide space heating and/or space cooling shall be sized no greater than one hundred fifty percent (150%) of the heating and cooling design loads as calculated above.

**EXCEPTIONS:** The following limited exemptions from the sizing limit shall be allowed; however, in all cases heating and/or cooling design load calculations shall be submitted.

1. For equipment which provides both heating and cooling in one package unit, including heat pumps with electric heating and cooling and gas-pack units with gas heating and electric cooling, compliance need only be demonstrated for either the space heating or space cooling system size.

2. Natural gas- or oil-fired space heating equipment whose total rated space heating output in any one dwelling unit is

- a. 40,000 Btu/h or less is exempt from the sizing limit,
- b. Larger than 40,000 Btu/h may exceed the one hundred fifty (150%) percent sizing limit but not exceed 250 percent provided that the installed equipment has

an annual fuel utilization efficiency (AFUE) of ninety (90%) percent or greater.

3. Stand-by equipment may be installed if controls and other devices are provided which allow redundant equipment to operate only when the primary equipment is not operating.

**503.3 Simultaneous Heating and Cooling:** Systems and equipment that provide simultaneous heating and cooling shall comply with the requirements in, as appropriate, Section 1422 or Section 1435.

**503.4 HVAC Equipment Performance Requirements:** All heating equipment shall meet the requirements of the National Appliance Energy Conservation Act (NAECA) and be so labeled. Equipment shall also comply with Section 1411.

**503.5 Reserved.**

**503.6 Balancing:** The HVAC system design shall provide a means for balancing air and water systems. Balancing the system shall include, but not be limited to, dampers, temperature and pressure test connections and balancing valves.

**503.7 Cooling with Outdoor Air (Economizer Cycle):** Systems and equipment that provide mechanical cooling shall comply with Section 1413 and, as appropriate, Section 1423 or 1433.

**503.8 Controls:**

**503.8.1 Temperature Control:** Each system shall be provided with at least one adjustable thermostat for the regulation of temperature. Each thermostat shall be capable of being set by adjustment or selection of sensors as follows:

**503.8.1.1:** When used to control heating only: Fifty-five degrees to seventy-five degrees F.

**503.8.1.2:** When used to control cooling only: Seventy degrees to eighty-five degrees F.

**503.8.1.3:** When used to control both heating and cooling, it shall be capable of being set from fifty-five degrees to eighty-five degrees F and shall be capable of operating the system heating and cooling in sequence. The thermostat and/or control system shall have an adjustable deadband of not less than ten degrees F.

**503.8.2 Humidity Control:** If a system is equipped with a means for adding moisture to maintain specific selected relative humidities in space or zones, a humidistat shall be provided. Humidistats shall be capable of being set to prevent new energy from being used to produce space-relative humidity above thirty percent.

**EXCEPTION:** Special uses requiring different relative humidities may be permitted when approved by the building official.

**503.8.3 Zoning for Temperature Control:**

**503.8.3.1 One- and Two-Family Dwellings:** At least one thermostat for regulation of space temperature shall be provided for each separate system. In addition, a readily accessible manual or automatic means shall be provided to partially restrict or shut off the heating and/or cooling input to each zone or floor.

503.8.3.2 Multifamily Dwellings: For multifamily dwellings, each individual dwelling unit shall have at least one thermostat for regulation of space temperature. A readily accessible manual or automatic means shall be provided to partially restrict or shut off the heating and/or cooling input to each room. Spaces other than living units shall meet the requirements of 503.8.3.3.

#### 503.8.3.3 Control Setback and Shutoff:

One- and Two-Family and Individual Multifamily dwelling units—The thermostat required in section 503.8.3.1 or section 503.8.3.2, or an alternate means such as a switch or clock, shall provide a readily accessible, manual or automatic means for reducing the energy required for heating and cooling during the periods of nonuse or reduced need, such as, but not limited to unoccupied periods and sleeping hours. Lowering thermostat set points to reduce energy consumption of heating systems shall not cause energy to be expended to reach the reduced setting.

503.8.3.4 Systems Serving Multiple Dwelling Units, Guest Rooms, and Common Areas: Systems that serve more than two dwelling units, guest rooms, and common areas shall comply with the control requirements in Sections 1412 and 1432, with the exceptions of Sections 1412.4.2 and 1432.1.

503.8.3.5 Heat Pump Controls: Programmable thermostats are required for all heat pump systems. The cut-on temperature for the compression heating shall be higher than the cut-on temperature for the supplementary heat, and the cut-off temperature for the compression heating shall be higher than the cut-off temperature for the supplementary heat. Heat pump thermostats will be capable of providing at least two programmable setback periods per day. The automatic setback thermostat shall have the capability of limiting the use of supplemental heat during the warm-up period.

503.9 Air Handling Duct System Insulation: Ducts, plenums and enclosures installed in or on buildings shall be thermally insulated per Table 5-11.

EXCEPTIONS: Duct insulation (except where required to prevent condensation) is not required in any of the following cases:

1. When the heat gain or loss of the ducts, without insulation, will not increase the energy requirements of the building.
2. Within the HVAC equipment.
3. Exhaust air ducts.
4. Supply or return air ducts installed in unvented crawl spaces with insulated walls, basements, or cellars in one- and two-family dwellings.

#### 503.10 Ducts.

503.10.1 Leakage Testing: High-pressure and medium-pressure ducts shall be leak tested in accordance with the 1985 Edition of the SMACNA HVAC Air Duct Leakage Test Manual with the rate of air leakage not to exceed the maximum rate specified in that standard.

503.10.2 Seams and Joints: All low-pressure supply and return duct transverse joints, and enclosed stud bays or joist cavities/space used to transport air, shall be securely fastened

and sealed with welds, gaskets, mastics (adhesives), or mastic-plus-embedded-fabric systems installed in accordance with the manufacturer's installation instructions.

#### EXCEPTIONS:

1. Ducts or building cavities used for air distribution that are located entirely within the conditioned space of the building are exempt from this section.
2. UL 181A listed tapes used with listed rigid fibrous glass ducts may be used as the primary sealant, when installed in accordance with the listing.
3. UL 181B listed tapes used with listed flexible air ducts may be used as the primary sealant, when installed in accordance with the listing.
4. Where enclosed stud bays or joist cavities/spaces are used to transport air sealing may be accomplished using drywall, drywall tape plus joint compound.
5. Tapes installed in accordance with the manufacturer's installation instructions, providing detailed information specific to application on ducts, including approved duct materials and required duct surface cleaning.

503.10.3 Dampers: Requirements for Automatic or manual dampers are found in the Washington State Ventilation and Indoor Air Quality Code.

503.11 Pipe Insulation: All piping shall be thermally insulated in accordance with Table 5-12.

EXCEPTION: Piping installed within unitary HVAC equipment.

Cold water pipes outside the conditioned space shall be insulated in accordance with the Washington State Plumbing Code (chapter 51-56 WAC).

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0503, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0503, filed 12/17/03, effective 7/1/04; 02-24-076, § 51-11-0503, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0503, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0503, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.020, 19.27A.045, and 19.27.020. 98-24-075, § 51-11-0503, filed 12/1/98, effective 7/1/99. Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0503, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0503, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0503, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0503, filed 12/19/90, effective 7/1/91.]

### WAC 51-11-0504 Service water heating.

504.1 Scope: The purpose of this section is to provide criteria for design and equipment selection that will produce energy savings when applied to service water heating.

#### 504.2 Water Heaters, Storage Tanks and Boilers:

504.2.1 Performance Efficiency: All Storage water heaters shall meet the requirements of the National Appliance Energy Conservation Act and be so labeled. All electric water heaters in unheated spaces or on concrete floors shall be placed on an incompressible, insulated surface with a minimum thermal resistance of R-10.

For combination space and service water heaters with a principal function of providing space heat, the Combined Annual Efficiency (CAE) may be calculated by using ASHRAE Standard 124-1991. Storage water heaters used in combination space heat and water heat applications shall have either an Energy Factor (EF) or a Combined Annual Efficiency (CAE) of not less than the following:

	Energy Factor (EF)	Combined Annual Efficiency (CAE)
<50 gallon storage	0.58	0.71
50 to 70 gallon storage	0.57	0.71
>70 gallon storage	0.55	0.70

504.2.2 Insulation: Heat loss from unfired hot-water storage tanks shall be limited to a maximum of 9.6 Btu/hr/ft<sup>2</sup>

EXCEPTIONS:

1. Systems with service/space heating boilers having a standby loss Btu/h less than:  
(13.3 pmd + 400)/n

determined by the fixture count method where:

pmd = probably maximum demand in gallons/hour as determined in accordance with Chapter 49 of Standard RS-11.

n = fraction of year when outdoor daily mean temperature exceeds 64.9° F.

The standby loss is to be determined for a test period of twenty-four-hour duration while maintaining a boiler water temperature of ninety degrees F above an ambient of sixty degrees F and a five foot stack on appliance.

2. For systems where the use of a single heating unit will lead to energy savings, such unit shall be utilized.

504.3 Automatic Controls: Service water heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use. Temperature setting range shall be set to one hundred twenty degrees F or forty-nine degrees C.

504.4 Shutdown: A separate switch shall be provided to permit turning off the energy supplied to electric service water heating systems. A separate valve shall be provided to permit turning off the energy supplied to the main burner(s) of all other types of service water heater systems.

504.5 Swimming Pools:

504.5.1: All pool heaters shall be equipped with readily accessible ON/OFF switch to allow shutting off the operation of the heater without adjusting the thermostat setting. Controls shall be provided to allow the water temperature to be regulated from the maximum design temperature down to sixty-five degrees F.

504.5.2 Pool Covers: Heated swimming pools shall be equipped with a pool cover, approved by the building official.

504.6 Pump Operation: Circulating hot water systems shall be controlled so that the circulation pump(s) can be conveniently turned off, automatically or manually, when the hot water system is not in operation.

504.7 Pipe Insulation: Piping shall be thermally insulated in accordance with section 503.11.

504.8 Conservation of Hot Water:

504.8.1 Showers and Lavatories: Showers and lavatories used for other than safety reasons shall be equipped with flow control devices or specially manufactured showerheads or aerators to limit the total water flow rate as set forth in chapter 51-56 WAC, as measured with both hot and cold faucets turned on to their maximum flow.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0504, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0504, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-0504, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0504, filed 1/8/98, effective 7/1/98.

(2007 Ed.)

of external tank surface area. The design ambient temperature shall be no higher than sixty-five degrees F.

504.2.3 Combination Service Water Heating/Space Heating Boilers: Service water heating equipment shall not be dependent on year round operation of space heating boilers.

Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0504, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0504, filed 12/19/90, effective 7/1/91.]

### WAC 51-11-0505 Lighting.

505.1 **Lighting Controls:** Hotel and motel guest rooms and guest suites shall have a master control device at the main room entry that controls all permanently installed luminaires and switched receptacles.

505.2 **Lighting Power:** Lighting shall comply with the Prescriptive Lighting Option in Section 1520 or the Lighting Power Allowance Option in Section 1530.

EXCEPTIONS:

1. Group R-3 and R-4 Occupancy and the dwelling unit portions of Group R-1 and R-2 Occupancy.
2. Lighting exempted by Section 1512.

505.3 **Outdoor Lighting:** Luminaires providing outdoor lighting and permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy luminaires.

EXCEPTIONS:

1. Permanently installed outdoor luminaires that are not high efficacy shall be allowed provided they are controlled by a motion sensor(s) with integral photo-control photosensor.
2. Permanently installed luminaires in or around swimming pools, water features.

505.4 **Linear Fluorescent Fixtures:** Linear fluorescent fixtures must be fitted with T-8 or smaller lamps (but not T-10 or T-12 lamps).

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0505, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0505, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-0505, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0505, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0505, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0505, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0525 Equation 1—Group R Occupancy.****EQUATION 1—GROUP R OCCUPANCY  
TARGET UA**

$$UA_T = U_W A_W + U_{BGW} A_{BGW} + U_{VG} A_{VG} + U_{OG} A_{OG} + U_F A_F + U_{RC} A_{RC} + U_{CC} A_{CC} + U_D A_D + F_S P_S$$

**Where:**

$UA_T$	=	the target combined thermal transmittance of the gross exterior wall, floor and roof/ceiling assembly area.
$U_W$	=	the thermal transmittance value of the opaque above grade wall area found in Table 5-1.
$A_W$	=	opaque above grade wall area.
$U_{BGW}$	=	the thermal transmittance value of the below grade opaque wall area found in Table 5-1.
$A_{BGW}$	=	opaque below grade wall area.
$U_{VG}$	=	the thermal transmittance value of the vertical glazing area found in Table 5-1.
$A_{VG}$	=	15% of the total floor area of the conditioned space minus $A_{OG}$
$U_{OG}$	=	the thermal transmittance value of the overhead glazing area found in Table 5-1 (see Table 5-1 footnote 2).
$A_{OG}$	=	overhead glazing area (if the proposed $A_{OG}$ exceeds 15 percent, the target $A_{OG}$ shall be 15 percent of the total floor area of the conditioned space).
$U_F$	=	the thermal transmittance value of the floor area found in Table 5-1.
$A_F$	=	floor area over unconditioned space.
$U_{RC}$	=	the thermal transmittance value of the roof/ceiling area found in Table 5-1.
$A_{RC}$	=	roof/ceiling area.
$U_{CC}$	=	the thermal transmittance value of the cathedral ceiling area found in Table 5-1.
$A_{CC}$	=	cathedral ceiling area.
$U_D$	=	the thermal transmittance value of the opaque door area found in Table 5-1.
$A_D$	=	opaque door area.
$F_S$	=	concrete slab component F-factor found in Table 5-1.
$P_S$	=	lineal ft. of concrete slab perimeter.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0525, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0525, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0525, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0525, filed 12/19/91, effective 7/1/92.]

**WAC 51-11-0526 Equation 2—All occupancies.****EQUATION 2 — ALL OCCUPANCIES**

$$U = \frac{1}{r_o + R_1 + R_2 \dots r_i}$$

**Where:**

$U$	=	the thermal transmittance of the assembly.
$r_o$	=	outside air film resistance.
$r_o$	=	.17 for all exterior surfaces.
$r_i$	=	inside air film resistance.
$r_i$	=	0.61 for interior horizontal surfaces, heat flow up.

$r_i$	=	0.92 for interior horizontal surfaces, heat flow down.
$r_i$	=	0.68 for interior vertical surfaces.
$R$	=	$\frac{1}{C} = \frac{X}{K}$ = measure of the resistance to the passage of heat for each element.
$C$	=	conductance, the heat flow through a specific material of specific thickness.
$K$	=	insulation value of a material per inch.
$X$	=	the thickness of the material in inches.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0526, filed 12/19/91, effective 7/1/92.]

**WAC 51-11-0527 Equation 3—Group R Occupancy.****EQUATION 3 — GROUP R OCCUPANCY  
PROPOSED UA**

$$UA = U_W A_W + U_{BGW} A_{BGW} + U_{VG} A_{VG} + U_{OG} A_{OG} + U_F A_F + U_{RC} A_{RC} + U_{CC} A_{CC} + U_D A_D + F_S P_S$$

**Where:**

$UA$	=	the combined thermal transmittance of the gross exterior wall, floor and roof/ceiling assembly area.
$U_W$	=	the thermal transmittance of the opaque wall area.
$A_W$	=	opaque wall area.
$U_{BGW}$	=	the thermal transmittance value of the below grade opaque wall area.
$A_{BGW}$	=	opaque below grade wall area.
$U_{VG}$	=	the thermal transmittance value of the vertical glazing area.
$A_{VG}$	=	vertical glazing area, including windows in exterior doors.

$U_{OG}$	=	the thermal transmittance value of the overhead glazing area.
$A_{OG}$	=	overhead glazing area.
$U_F$	=	the thermal transmittance of the floor area.
$A_F$	=	floor area over unconditioned space.
$U_{RC}$	=	the thermal transmittance of the roof/ceiling area.
$A_{RC}$	=	roof/ceiling area.
$U_{CC}$	=	the thermal transmittance of the cathedral ceiling area.
$A_{CC}$	=	cathedral ceiling area.
$U_D$	=	the thermal transmittance value of the opaque door area.
$A_D$	=	opaque door area.
$F_s$	=	concrete slab component F-factor.
$P_s$	=	lineal ft. of concrete slab perimeter.

**NOTE :** Where more than one type of wall, window, roof/ceiling, door and skylight is used, the U and A terms for those items shall be expanded into sub-elements as:

$$U_{W1}A_{W1} + U_{W2}A_{W2} + U_{W3}A_{W3} + \dots \text{ etc.}$$

[Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0527, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0527, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0527, filed 12/19/91, effective 7/1/92.]

### WAC 51-11-0528 Equation 4—Reserved.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0528, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0528, filed 12/19/91, effective 7/1/92.]

### WAC 51-11-0529 Equation 5—Reserved.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0529, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0529, filed 12/19/91, effective 7/1/92.]

### WAC 51-11-0530 Table 5-1.

**TABLE 5-1**  
**TARGET COMPONENT VALUES FOR GROUP R OCCUPANCY**

Component	Climate Zone	
	1	2
Glazing % Floor Area	15%	15%
Vertical Glazing U-Factor		
Group R-1 and R-2	U = 0.400	U = 0.400
Group R-3 and R-4	U = 0.350	U = 0.350
Overhead Glazing U-Factor	U = 0.58	U = 0.58
Doors	U = 0.200 (R-5)	U = 0.200 (R-5)
Ceilings		
Attic	U = 0.031 (R-38)	U = 0.031 (R-38)
Single Rafter/ Joist Vaulted <sup>3</sup>	U = 0.034 (R-30)	U = 0.034 (R-30)
Walls <sup>1,2</sup>	U = 0.057 (R-21)	U = 0.044 (R-19A + R-5)
Floors	U = 0.029 (R-30)	U = 0.029 (R-30)
Slab on Grade	F = 0.54 (R-10)	F = 0.54 (R-10)
Slab R-Value		
Below Grade Interior		
Wall R-Value	R-19	R-19
2' Depth: Walls	U = 0.043	U = 0.043
Slab	F = 0.69	F = 0.69
3.5' Depth: Walls	U = 0.041	U = 0.041
Slab	F = 0.64	F = 0.64
7' Depth: Walls	U = 0.037	U = 0.037
Slab	F = 0.57	F = 0.57
Below Grade Exterior		
Wall R-Value	R-10	R-12
2' Depth: Walls	U = 0.070	U = 0.061
Slab	F = 0.60	F = 0.60

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Component	Climate Zone	
	1	2
3.5' Depth: Walls	U = 0.064	U = 0.057
Slab	F = 0.57	F = 0.57
7' Depth: Walls	U = 0.056	U = 0.050
Slab	F = 0.42	F = 0.42

1. Log and Solid Timber walls that have a minimum average thickness of 3.5" in spaces with space heating by "other fuels" are exempt from wall target UA and proposed UA calculations.

2. "A" means advanced framing. For more information, see Section 1005.2.

3. Requirement applicable only to single rafter or joist vaulted ceilings where both (a) the distance between the top of the ceiling and the underside of the roof sheathing is less than 12 inches and (b) there is a minimum 1-inch vented airspace above the insulation. Other single rafter or joist vaulted ceilings shall comply with the "ceiling" requirements. This option is limited to 500 square feet of ceiling area for any one dwelling unit.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0530, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0530, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0530, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0530, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226. 95-01-126, § 51-11-0530, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0530, filed 12/19/91, effective 7/1/92.]

### WAC 51-11-0531 Table 5-2—Reserved.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0531, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0531, filed 12/19/91, effective 7/1/92.]

### WAC 51-11-0532 Table 5-3—Reserved.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0532, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0532, filed 12/19/91, effective 7/1/92.]

### WAC 51-11-0533 Table 5-4—Reserved.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0533, filed 12/18/01, effective 7/1/02. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0533, filed 12/19/91, effective 7/1/92.]

### WAC 51-11-0534 Table 5-5—Reserved.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0534, filed 12/18/01, effective 7/1/02. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0534, filed 12/19/91, effective 7/1/92.]

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**WAC 51-11-0535 Table 5-6—Reserved.**

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 02-01-112, § 51-11-0535, filed 12/18/01, effective 7/1/02. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0535, filed 12/19/91, effective 7/1/92.]

**WAC 51-11-0536 Table 5-7—Reserved.**

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 02-01-112, § 51-11-0536, filed 12/18/01, effective 7/1/02. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0536, filed 12/19/91, effective 7/1/92.]

**WAC 51-11-0537 Table 5-8—Reserved.**

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 02-01-112, § 51-11-0537, filed 12/18/01, effective 7/1/02. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0537, filed 12/19/91, effective 7/1/92.]

**WAC 51-11-0538 Table 5-9—Reserved.**

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-0538, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0538, filed 12/19/91, effective 7/1/92.]

**WAC 51-11-0539 Table 5-10—Reserved.**

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-0539, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0539, filed 12/19/91, effective 7/1/92.]

**WAC 51-11-0540 Table 5-11.**

TABLE 5-11  
INSULATION OF DUCTS

DUCT LOCATION	CLIMATE ZONE	GROUP R OCCUPANCY
		HEATING OR COOLING DUCTS
On roof or on exterior of building	I	E and W
	II	D and W
Attic, garage, crawl space, in walls <sup>1</sup> , in floor/ceiling <sup>1</sup>	I	E
	II	E
Within the conditioned space or in heated basement		None Required
In cement slab or in ground		B

Note: Where ducts are used for both heating and cooling, the minimum insulation shall be as required for the most restrictive condition.

- <sup>1</sup> Insulation may be omitted on that portion of a duct which is located within a wall or floor-ceiling space where both sides of this space are exposed to conditioned air and where this space is not ventilated or otherwise exposed to unconditioned air.
- <sup>2</sup> Vapor barriers shall be installed on conditioned air supply ducts in geographic areas where the average of the July, August, and September mean dewpoint temperature exceeds 60°F.

INSULATION TYPES: Minimum densities and out-of-package thickness.

- A. 0.5-inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber blanket or equivalent to provide an installed total thermal resistance of at least R-2.
- B. 2-inch 0.60 lb/cu. ft. mineral or glass fiber blanket 1.5-inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber blanket. 1.5-inch 3 to 7 lb/cu. ft. mineral or glass fiber board or equivalent to provide an installed total thermal resistance of at least R-5.
- C. 3-inch 0.60 lb/cu. ft. mineral or glass fiber blanket 2-inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber blanket. 2-inch 3 to 7 lb/cu. ft. mineral or glass fiber board or equivalent to provide an installed total thermal resistance of at least R-7.
- D. 4-inch 0.60 lb/cu. ft. mineral or glass fiber blanket 3-inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber blanket. 3-inch 3 to 7 lb/cu. ft. mineral or glass fiber board or equivalent to provide an installed total thermal resistance of at least R-10.
- E. 3.5 inch 0.60 lb/cu. ft. mineral or glass fiber blanket, 2.5 inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiberboard or equivalent to provide an installed total thermal resistance of at least R-8.
- V. Vapor barrier, with perm rating not greater than 0.5 perm, all joints sealed.
- W. Approved weatherproof barrier.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0540, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-0540, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0540, filed 12/19/91, effective 7/1/92.]

**WAC 51-11-0541 Table 5-12.**

TABLE 5-12  
MINIMUM PIPE INSULATION REQUIREMENTS

Fluid Design Operating Temp. Range, °F	Insulation Conductivity		Normal Pipe Diameter (in.)					
	Conductivity Range Btu•in./(h • ft <sup>2</sup> • °F)	Mean Rating Temp. °F	Runouts <sup>2</sup> up to 2	1 and less	> 1 to 2	> 2 to 4	> 4 to 6	> 6
Heating systems (Steam, Steam Condensate and Hot water)		Nominal Insulation Thickness						
Above 350	0.32-0.34	250	1.5	2.5	2.5	3.0	3.5	3.5
251-350	0.29-0.31	200	1.5	2.0	2.5	2.5	3.5	3.5
201-250	0.27-0.30	150	1.0	1.5	1.5	2.0	2.0	3.5
141-200	0.25-0.29	125	0.5	1.5	1.5	1.5	1.5	1.5
105-140	0.24-0.28	100	0.5	1.0	1.0	1.0	1.5	1.5

Domestic and Service Hot Water Systems								
105 and Greater	0.24-0.28	100	0.5	1.0	1.0	1.5	1.5	1.5
Cooling Systems (Chilled Water, Brine and Refrigerant)								
40-55	0.23-0.27	75	0.5	0.5	0.75	1.0	1.0	1.0
Below 40	0.23-0.27	75	1.0	1.0	1.5	1.5	1.5	1.5

1. Alternative Insulation Types. Insulation thicknesses in Table 5-12 are based on insulation with thermal conductivities within the range listed in Table 5-12 for each fluid operating temperature range, rated in accordance with ASTM C 335-84 at the mean temperature listed in the table. For insulation that has a conductivity outside the range shown in Table 5-12 for the applicable fluid operating temperature range at the mean rating temperature shown (when rounded to the nearest 0.01 Btu•in./(h•ft<sup>2</sup>•°F)), the minimum thickness shall be determined in accordance with the following equation:

$$T = PR[(1 + t/PR)^{K/k} - 1]$$

Where

- T = Minimum insulation thickness for material with conductivity K, inches.  
 PR = Pipe actual outside radius, inches  
 t = Insulation thickness from Table 5-12, inches  
 K = Conductivity of alternate material at the mean rating temperature indicated in Table 5-12 for the applicable fluid temperature range, Btu•in./(h•ft<sup>2</sup>•°F)  
 k = The lower value of the conductivity range listed in Table 5-12 for the applicable fluid temperature range, Btu•in./(h•ft<sup>2</sup>•°F)

2. Runouts to individual terminal units not exceeding 12 ft. in length.

[Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0541, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0541, filed 12/19/91, effective 7/1/92.]

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

#### WAC 51-11-0542 Table 5-13—Reserved.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0542, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0542, filed 12/19/91, effective 7/1/92.]

#### WAC 51-11-0600 Chapter 6 building design by prescriptive requirements approach.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-06-065, § 51-11-0600, filed 3/1/91, effective 7/1/91.]

#### WAC 51-11-0601 Scope.

601.1 General: This chapter establishes design criteria in terms of prescribed requirements for building construction.

The provisions of this chapter are applicable to all Group R Occupancies. Occupancies shall comply with all the requirements of Chapter 5 except for the modifications herein specified.

For wood frame assemblies, the building envelope requirements of this chapter may be met by installing one of the prescriptive packages in Table 6-1 or 6-2. Installed components shall meet the requirements of section 602. Compliance with nominal R-Values shall be demonstrated for the thermal resistance of the added insulation in framing cavities and/or insulated sheathing only and shall not include the thermal transmittance of other building materials or air films, but shall permit interruption by occasional framing members. Other than wood frame assemblies with continuous insulation uninterrupted by framing shall also be allowed to comply with nominal R-values.

For metal frame assemblies, compliance shall be demonstrated in accordance with Chapter 4 or Chapter 5 based on the assemblies in Chapter 10. Compliance with nominal R-values is not allowed, unless the full nominal R-value of the

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insulation is installed either inside or outside of the framing and is uninterrupted by framing.

**EXCEPTION:** Group R-1 and R-2 Occupancy buildings may use a maximum area weighted average U-factor for components not exceeding those prescribed in Paths III and V in Table 6-1 or Paths IV and VI in Table 6-2.

[Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0601, filed 12/17/03, effective 7/1/04; 02-24-076, § 51-11-0601, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0601, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0601, filed 1/5/01, effective 7/1/01. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0601, filed 2/10/94, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0601, filed 12/19/90, effective 7/1/91.]

#### WAC 51-11-0602 Building envelope requirements for Group R Occupancy.

602.1 Roof/Ceiling: Ceilings below vented attics and single-rafter, joist-vaulted ceilings shall be insulated to not less than the nominal R-value specified for ceilings in Table 6-1 or 6-2 as applicable.

602.2 Exterior Walls Both Above and Below Grade: Above grade exterior walls shall be insulated to not less than the nominal R-value specified in Table 6-1 or 6-2 as applicable. The following walls should be considered to meet R-21 without additional documentation:

1. 2 x 6 framed and insulated with R-21 fiberglass batts.
2. 2 x 4 framed and insulated with R-15 fiberglass batts plus R-4.0 foam sheathing.
3. 2 x 4 framed and insulated with R-13 fiberglass batts plus R-5.0 foam sheathing.

602.3 Exterior Walls (Below Grade): Below grade exterior walls surrounding conditioned space shall be insulated to



not less than the nominal R-value specified for below grade walls in Table 6-1 or 6-2 as applicable.

**602.4 Slab-on-grade Floors:** Slab-on-grade floors shall be insulated along their perimeter to not less than the nominal R-values specified for slab-on-grade floors in Table 6-1 or 6-2 as applicable. Slab insulation shall be installed in compliance with section 502.1.4.8. See Chapter 5, section 502.1.4.9, for additional requirements for radiant slab heating.

**602.5 Floors Over Unconditioned Space:** Floors over unconditioned spaces, such as vented crawl spaces, unconditioned basements, and parking garages shall be insulated to not less than the nominal R-value shown for floors over unconditioned spaces, in Table 6-1 or 6-2.

**602.6 Exterior Doors:** Doors shall comply with Sections 602.6.1 and 602.6.2.

**EXCEPTIONS:**

1. Glazed doors whose area and U-factor are included in the calculations for compliance with the requirements for glazing in section 602.7 shall be exempt from the door U-factor requirements prescribed in Table 6-1 or 6-2.
2. One unlabeled or untested exterior swinging door with the maximum area of 24 square feet may be installed per unit for ornamental, security or architectural purposes. Products using this exception shall not be included in either the U-factor or glazing area calculation requirements.

**602.6.1 Exterior Door Area:** For half-lite and full-lite doors, the glazing area shall be included in calculating the allowed total glazing area in Section 602.7.1. Single glazing used for ornamental, security or architectural purposes shall be calculated using the exception to Section 602.7.2.

**602.6.2 Exterior Door U-Factor:** Doors, including fire doors, shall have a maximum area weighted average U-factor not exceeding that prescribed in Table 6-1 or 6-2.

#### 602.7 Glazing:

**602.7.1 Glazing Area:** The total glazing area as defined in Chapter 2 shall not exceed the percentage of gross conditioned floor area specified in Table 6-1 or 6-2. This area shall also include any glazing in doors.

**602.7.2 Glazing U-Factor:** The total glazing area as defined in Chapter 2 shall have an area weighted average U-factor not to exceed that specified in Table 6-1 or 6-2. U-factors for glazing shall be determined in accordance with section 502.1.5. These areas and U-factors shall also include any doors using the exception of section 602.6.

If the U-factors for all vertical and overhead glazing products are below the appropriate U-factor specified, then no calculations are required. If compliance is to be achieved

through an area weighted calculation, then the areas and U-factors shall be included in the plans submitted with a building permit application.

**EXCEPTION:** Single glazing for ornamental, security, or architectural purposes and double glazed garden windows with a wood or vinyl frame shall be exempt from the U-factor calculations but shall have its area tripled and shall be included in the percentage of the total glazing area as allowed for in Table 6-1 or 6-2. The maximum area (before tripling) allowed for the total of all single glazing and garden windows is one percent of the floor area.

**602.8 Air Leakage For Group R Occupancy:** The minimum air leakage control measures shall be as specified in section 502.4 as applicable.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0602, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 02-24-076, § 51-11-0602, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0602, filed 12/18/01, effective 7/1/02; 98-03-003, § 51-11-0602, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0602, filed 2/10/94, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0602, filed 12/19/90, effective 7/1/91.]

### WAC 51-11-0603 Building mechanical systems for Group R Occupancy.

**603.1:** Group R Occupancies that are space heated by air-to-air, ground-to-air, or water-to-air heat pumps shall comply with Table 6-1 or 6-2. System sizing shall be determined by an analysis consistent with section 503.2 of this Code, or, when approved by the building official, Chapter 9. All mechanical equipment efficiencies and service water heating system efficiencies shall comply with standards as stated in sections 503 and 504 of this Code.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0603, filed 12/18/01, effective 7/1/02. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0603, filed 2/10/94, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0603, filed 12/19/90, effective 7/1/91.]

### WAC 51-11-0604 Reserved.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-0604, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0604, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0605 Lighting.** Lighting shall comply with Section 505.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-0605, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0605, filed 10/18/93, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0605, filed 12/19/90, effective 7/1/91.]

### WAC 51-11-0625 Table 6-1.

**TABLE 6-1**  
**PRESCRIPTIVE REQUIREMENTS<sup>0,1</sup> FOR GROUP R OCCUPANCY**  
**CLIMATE ZONE 1**

Option	Glazing Area <sup>10</sup> : % of Floor	Glazing U-Factor		Door <sup>9</sup> U- Factor	Ceiling <sup>2</sup>	Vaulted Ceiling <sup>3</sup>	Wall <sup>12</sup> Above Grade	Wall• int <sup>4</sup> Below Grade	Wall• ext <sup>4</sup> Below Grade	Floor <sup>5</sup>	Slab <sup>6</sup> on Grade
		Vertical	Overhead <sup>11</sup>								
<b>I.</b>	10%	0.32	0.58	0.20	R-38	R-30	R-15	R-15	R-10	R-30	R-10
<b>II.*</b>	15%	0.35	0.58	0.20	R-38	R-30	R-21	R-21	R-10	R-30	R-10

Option	Glazing Area <sup>10</sup> : % of Floor	Glazing U-Factor		Door <sup>9</sup> U-Factor	Ceiling <sup>2</sup>	Vaulted Ceiling <sup>3</sup>	Wall <sup>12</sup> Above Grade	Wall• int <sup>4</sup> Below Grade	Wall• ext <sup>4</sup> Below Grade	Floor <sup>5</sup>	Slab <sup>6</sup> on Grade
		Vertical	Overhead <sup>11</sup>								
<b>III.</b>	25% Group R-1 and R-2 Occupancy only	0.40	0.58	0.20	R-38/ U = 0.031	R-30/ U = 0.034	R-21/ U = 0.057	R-15	R-10	R-30/ U = 0.029	R-10
<b>IV.</b>	Unlimited Group R-3 and R-4 Occupancy only	0.35	0.58	0.20	R-38	R-30	R-21	R-21	R-10	R-30	R-10
<b>V.</b>	Unlimited Group R-1 and R-2 Occupancy only	0.35	0.58	0.20	R-38/ U = 0.031	R-30/ U = 0.034	R-21/ U = 0.057	R-15	R-10	R-30/ U = 0.029	R-10

\* Reference Case

0. Nominal R-values are for wood frame assemblies only or assemblies built in accordance with Section 601.1.
1. Minimum requirements for each option listed. For example, if a proposed design has a glazing ratio to the conditioned floor area of 13%, it shall comply with all of the requirements of the 15% glazing option (or higher). Proposed designs which cannot meet the specific requirements of a listed option above may calculate compliance by Chapters 4 or 5 of this Code.
2. Requirement applies to all ceilings except single rafter or joist vaulted ceilings complying with note 3. 'Adv' denotes Advanced Framed Ceiling.
3. Requirement applicable only to single rafter or joist vaulted ceilings where both (a) the distance between the top of the ceiling and the underside of the roof sheathing is less than 12 inches and (b) there is a minimum 1-inch vented airspace above the insulation. Other single rafter or joist vaulted ceilings shall comply with the "ceiling" requirements. This option is limited to 500 square feet of ceiling area for any one dwelling unit.
4. Below grade walls shall be insulated either on the exterior to a minimum level of R-10, or on the interior to the same level as walls above grade. Exterior insulation installed on below grade walls shall be a water resistant material, manufactured for its intended use, and installed according to the manufacturer's specifications. See Section 602.2.
5. Floors over crawl spaces or exposed to ambient air conditions.
6. Required slab perimeter insulation shall be a water resistant material, manufactured for its intended use, and installed according to manufacturer's specifications. See Section 602.4.
7. Int. denotes standard framing 16 inches on center with headers insulated with a minimum of R-10 insulation.
8. This wall insulation requirement denotes R-19 wall cavity insulation plus R-5 foam sheathing.
9. Doors, including all fire doors, shall be assigned default U-factors from Table 10-6C.
10. Where a maximum glazing area is listed, the total glazing area (combined vertical plus overhead) as a percent of gross conditioned floor area shall be less than or equal to that value. Overhead glazing with U-factor of U = 0.40 or less is not included in glazing area limitations.
11. Overhead glazing shall have U-factors determined in accordance with NFRC 100 or as specified in Section 502.1.5.
12. Log and solid timber walls with a minimum average thickness of 3.5" are exempt from this insulation requirement.

**TABLE 6-2**  
**PRESCRIPTIVE REQUIREMENTS<sup>0,1</sup> FOR GROUP R OCCUPANCY**  
**CLIMATE ZONE 2**

Option	Glazing Area <sup>10</sup> : % of Floor	Glazing U-Factor		Door <sup>9</sup> U-Factor	Ceiling <sup>2</sup>	Vaulted Ceiling <sup>3</sup>	Wall <sup>12</sup> Above Grade	Wall• int <sup>4</sup> Below Grade	Wall• ext <sup>4</sup> Below Grade	Floor <sup>5</sup>	Slab <sup>6</sup> on Grade
		Vertical	Overhead <sup>11</sup>								
<b>I.</b>	12%	0.35	0.58	0.20	R-38	R-30	R-21 Int <sup>7</sup>	R-21	R-12	R-30	R-10
<b>II.*</b>	15%	0.35	0.58	0.20	R-38	R-30	R-19 +R-5 <sup>8</sup>	R-21	R-12	R-30	R-10
<b>III.</b>	17%	0.32	0.58	0.20	R-38	R-30	R-19 +R-5 <sup>8</sup>	R-21	R-12	R-30	R-10
<b>IV.</b>	25% Group R-1 and R-2 Occupancy only	0.35	0.58	0.20	R-38/ U = 0.031	R-30/ U = 0.034	R-21 int <sup>7</sup> / U = 0.054	R-15	R-12	R-30/ U = 0.029	R-10/ F = 0.54
<b>V.</b>	Unlimited Group R-3 and R-4 Occupancy only	0.35	0.58	0.20	R-38	R-30	R-19 +R-5 <sup>8</sup>	R-21	R-12	R-30	R-10
<b>VI.</b>	Unlimited Group R-3 and R-4 Occupancies only	0.30	0.58	0.20	R-49 or R-38 ADV	R-38	R-21 int <sup>7</sup>	R-21	R-12	R-30	R-10
<b>VII.</b>	Unlimited Group R-1 Occupancy only	0.32	0.58	0.20	R-38/ U = 0.031	R-30/ U = 0.034	R-21 int <sup>7</sup> / U = 0.054	R-15	R-12	R-30/ U = 0.029	R-10/ F = 0.54

\* Reference Case

0. Nominal R-values are for wood frame assemblies only or assemblies built in accordance with Section 601.1.
1. Minimum requirements for each option listed. For example, if a proposed design has a glazing ratio to the conditioned floor area of 13%, it shall comply with all of the requirements of the 15% glazing option (or higher). Proposed designs which cannot meet the specific requirements of a listed option above may calculate compliance by Chapters 4 or 5 of this Code.
2. Requirement applies to all ceilings except single rafter or joist vaulted ceilings complying with note 3. 'Adv' denotes Advanced Framed Ceiling.
3. Requirement applicable only to single rafter or joist vaulted ceilings where both (a) the distance between the top of the ceiling and the underside of the roof sheathing is less than 12 inches and (b) there is a minimum 1-inch vented airspace above the insulation. Other single rafter or joist vaulted ceilings shall comply with the "ceiling" requirements. This option is limited to 500 square feet of ceiling area for any one dwelling unit.
4. Below grade walls shall be insulated either on the exterior to a minimum level of R-12, or on the interior to the same level as walls above grade. Exterior insulation installed on below grade walls shall be a water resistant material, manufactured for its intended use, and installed according to the manufacturer's specifications. See Section 602.2.
5. Floors over crawl spaces or exposed to ambient air conditions.
6. Required slab perimeter insulation shall be a water resistant material, manufactured for its intended use, and installed according to manufacturer's specifications. See Section 602.4.
7. Int. denotes standard framing 16 inches on center with headers insulated with a minimum of R-10 insulation.
8. This wall insulation requirement denotes R-19 wall cavity insulation plus R-5 foam sheathing.
9. Doors, including all fire doors, shall be assigned default U-factors from Table 10-6C.

10. Where a maximum glazing area is listed, the total glazing area (combined vertical plus overhead) as a percent of gross conditioned floor area shall be less than or equal to that value. Overhead glazing with U-factor of  $U = 0.40$  or less is not included in glazing area limitations.
11. Overhead glazing shall have U-factors determined in accordance with NFRC 100 or as specified in Section 502.1.5.
12. Log and solid timber walls with a minimum average thickness of 3.5" are exempt from this insulation requirement.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0625, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0625, filed 12/17/03, effective 7/1/04; 02-24-076, § 51-11-0625, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0625, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0625, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0625, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226. 95-01-126, § 51-11-0625, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0625, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0625, filed 12/19/91, effective 7/1/92.]

### WAC 51-11-0700 Chapter 7—Standards.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0700, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0701 Scope.** The following standards shall apply to Chapters 1 through 20. The standards and portions thereof, which are referred to in various parts of this Code shall be part of the Washington State Energy Code and are hereby declared to be a part of this Code.

#### REFERENCE STANDARD

NO.	TITLE AND SOURCE
RS-1	2005 ASHRAE Fundamentals Handbook.
RS-2	Super Good Cents Technical Reference C Builder's Field Guide.
RS-3	(Reserved).
RS-4	ASHRAE Standard 55-2004 Thermal Environmental Conditions for Human Occupancy.
RS-5	2006 ASHRAE Refrigeration Handbook.
RS-6	SMACNA, Installation Standards for Residential Heating and Air Conditioning Systems, 6th Edition, 1988.
RS-7	SMACNA, HVAC Duct Construction Standards, Metal and Flexible, 2nd Edition, 1995.
RS-8	SMACNA, Fibrous Glass Duct Construction Standards, 6th Edition, 1992.
RS-9	ASHRAE/IESNA Standard 90.1-2004, Energy Standard for Buildings Except Low-Rise Residential Buildings.
RS-10	2004 ASHRAE Systems and Equipment Handbook.
RS-11	2003 ASHRAE HVAC Systems and Applications Handbook.
RS-12	through RS-28 (Reserved).
RS-29	Nonresidential Building Design by Systems Analysis.
RS-30	Title 10, Code of Federal Regulations (CFR), Part 430 (March 14, 1988).
RS-31	National Fenestration Rating Council (NFRC) Standard 100-2004.

#### REFERENCE

##### STANDARD

NO.	TITLE AND SOURCE
RS-32	Seattle EnvStd 2006.

#### ACCREDITED AUTHORITATIVE AGENCIES

ANSI refers to the American National Standards Institute, Inc., 11 West 42nd Street, New York, NY 10036  
Phone 212-642-4900 fax 212-398-0023, internet [www.ansi.org](http://www.ansi.org)

ARI refers to the Air Conditioning and Refrigeration Institute, 4301 N. Fairfax Dr., Suite 425, Arlington, VA 22203  
Phone 703-524-8800 fax 703-528-3816, internet [www.ari.org](http://www.ari.org)

ASHRAE refers to the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc., 1791 Tullie Circle, N.E., Atlanta, GA 30329  
Phone 404-636-8400 fax 404-321-5478, internet [www.ashrae.org](http://www.ashrae.org)

ASTM refers to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959  
Phone 610-832-9585 fax 610-832-9555, internet [www.astm.org](http://www.astm.org)

CTI refers to the Cooling Tower Institute, 530 Wells Fargo Drive, Suite 218, Houston, TX 77090  
Phone 281-583-4087 fax 281-537-1721, internet [www.cti.org](http://www.cti.org)

IESNA refers to the Illuminating Engineering Society of North America, 120 Wall Street, Floor 17, New York, NY 10005-4001  
Phone 212-248-5000 fax 212-248-5017, internet [www.iesna.org](http://www.iesna.org)

NFRC refers to the National Fenestration Rating Council, Incorporated, 8484 Georgia Avenue, Suite 320, Silver Spring, Maryland 20910  
Phone 301-589-1776 fax 301-589-3884, internet [www.nfrc.org](http://www.nfrc.org)

SMACNA refers to the Sheet Metal and Air Conditioning Contractors National Association, Inc., 4201 Lafayette Center Drive, P.O. Box 221230, Chantilly, VA 20153-1230  
Phone 703-803-2980 fax 703-803-3732, internet [www.smacna.org](http://www.smacna.org)

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0701, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0701, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-0701, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0701, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0701, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0800 Section 0800—Suggested software for chapter 4 systems analysis approach for Group R Occupancy.**

Program Name:	Source
CALPAS 3	BSG Software 40 Lincoln Street Lexington, MA 02173 (617) 861-0109
DOE 2	ACROSOF/CAER Engineers 1204-1/2 Washington Avenue Golden, CO 80401 (303) 279-8136
F-LOAD	F-CHART SOFTWARE 4406 Fox Bluff Rd. Middleton, WI 53562 (608) 836-8531
MICROPAS	ENERCOMP 1721 Arroyo Drive Auburn, CA 95603 (800) 755-5903
SUNDAY	ECOTOPE 2812 East Madison St. Seattle, WA 98112 (206) 322-3753

[Statutory Authority: RCW 19.27A.020, 19.27A.045. 02-24-076, § 51-11-0800, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0800, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0800, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-0900 Section 0900—Reserved.**

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0900, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0900, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0900, filed 12/18/01, effective 7/1/02. Statutory Authority: Chapters 19.27 and 19.27A RCW and

1994 c 226. 95-01-126, § 51-11-0900, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0900, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-1000 Chapter 10.**

**Section 1000 Default heat-loss coefficients.**

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-1000, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1000, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-1001 Section 1001 General.**

**1001.1 Scope:** The following defaults shall apply to Chapters 1 through 20. This chapter includes tables of seasonal average heat-loss coefficients for specified nominal insulation. The heat-loss coefficients may also be used for heating system sizing.

**1001.2 Description:** These coefficients were developed primarily from data and procedures from Standard RS-1, and taken specifically from Standard RS-2, listed in Chapter 7.

Coefficients not contained in this chapter may be computed using the procedures listed in these references if the assumptions in the following sections and Standard RS-2, listed in Chapter 7, are used, along with data from the sources referenced above.

**1001.3 Air Films:** Default R-values used for air films shall be as follows:

R-Value	Condition
0.17	All exterior surfaces
0.61	Interior horizontal surfaces, heat flow up
0.92	Interior horizontal surfaces, heat flow down
0.68	Interior vertical surfaces

**1001.4 Compression of Insulation:** Insulation which is compressed shall be rated in accordance with Table 10-A or reduction in value may be calculated in accordance with the procedures in Standard RS-1, listed in Chapter 7.

**TABLE 10-A**  
**R-Value of Fiberglass Batts Compressed within Various Depth Cavities**

Insulation R-Value at Standard Thickness												
R-Value		38	30	22	21	19	15	13	11	8	5	3
Standard Thickness		12"	9-1/2"	6-3/4"	5-1/2"	6-1/4"	3-1/2"	3-5/8"	3-1/2"	2-1/2"	1-1/2"	3/4"
Nominal Lumber Sizes, Inches	Actual Depth of Cavity, Inches	Insulation R-Values when Installed in a Confined Cavity										
2 x 12	11-1/4	37	—	—	—	—	—	—	—	—	—	—
2 x 10	9-1/4	32	30	—	—	—	—	—	—	—	—	—
2 x 8	7-1/4	27	26	—	—	—	—	—	—	—	—	—
2 x 6	5-1/2	—	21	20	21	18	—	—	—	—	—	—
2 x 4	3-1/2	—	—	14	—	13	15	13	11	—	—	—
2 x 3	2-1/2	—	—	—	—	—	—	9.8	—	—	—	—
2 x 2	1-1/2	—	—	—	—	—	—	6.3	6.0	5.7	5.0	—
2 x 1	3/4	—	—	—	—	—	—	—	—	—	3.2	3.0

[Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1001, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1001, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1001, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-1002 Section 1002: Below grade walls and slabs.**

1002.1 General: Table 10-1 lists heat-loss coefficients for below-grade walls and floors.

Coefficients for below-grade walls are given as U-factors (Btu/hr • ft<sup>2</sup> • °F of wall area). Coefficients for below-grade slabs are listed as F-factors (Btu/hr • ft • °F per lineal foot of slab perimeter).

Below-grade wall U-factors are only valid when used with the accompanying below-grade slab F-factors, and vice versa.

1002.2 Component Description: All below-grade walls are assumed to be eight-inch concrete. The wall is assumed to extend from the slab upward to the top of the mud sill for the distance specified in Table 10-1, with six inches of concrete wall extending above grade.

Interior insulation is assumed to be fiberglass batts placed in the cavity formed by 2x4 framing on twenty-four inch centers with one-half inch of gypsum board as the interior finish material. Exterior insulation is assumed to be applied directly to the exterior of the below-grade wall from

the top of the wall to the footing. The exterior case does not assume any interior framing or sheetrock.

In all cases, the entire wall surface is assumed to be insulated to the indicated nominal level with the appropriate framing and insulation application. Coefficients are listed for wall depths of two, three and one-half, and seven feet below grade. Basements shallower than two feet should use on-grade slab coefficients.

Heat-loss calculations for wall areas above grade should use above-grade wall U-factors, beginning at the mudsill.

1002.3 Insulation Description: Coefficients are listed for the following four configurations:

1. Uninsulated: No insulation or interior finish.
2. Interior insulation: Interior 2x4 insulated wall without a thermal break between concrete wall and slab.
3. Interior insulation w/thermal break: Interior 2x4 insulated wall with R-5 rigid board providing a thermal break between the concrete wall and the slab.
4. Exterior insulation: Insulation applied directly to the exterior surface of the concrete wall.

**TABLE 10-1  
DEFAULT WALL U-FACTORS AND SLAB F-FACTORS FOR BASEMENTS**

	<b>Below Grade Wall U-factor</b>	<b>Below Grade Slab F-factor</b>
<b>2-Foot Depth Below Grade</b>		
Uninsulated	0.350	0.59
R-11 Interior	0.066	0.68
R-11 Interior w/tb	0.070	0.60
R-19 Interior	0.043	0.69
R-19 Interior w/tb	0.045	0.61
R-10 Exterior	0.070	0.60
R-12 Exterior	0.061	0.60
<b>3.5-Foot Depth Below Grade</b>		
Uninsulated	0.278	0.53
R-11 Interior	0.062	0.63
R-11 Interior w/tb	0.064	0.57
R-19 Interior	0.041	0.64
R-19 Interior w/tb	0.042	0.57
R-10 Exterior	0.064	0.57
R-12 Exterior	0.057	0.57
<b>7-Foot Depth Below Grade</b>		
Uninsulated	0.193	0.46
R-11 Interior	0.054	0.56
R-11 Interior w/tb	0.056	0.42
R-19 Interior	0.037	0.57
R-19 Interior w/tb	0.038	0.43
R-10 Exterior	0.056	0.42
R-12 Exterior	0.050	0.42

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1002, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1002, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1002, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-1003 Section 1003: On-grade slab floors.**

1003.1 General: Table 10-2 lists heat-loss coefficients for heated on-grade slab floors, in units of Btu/h • °F per lineal foot of perimeter.

1003.2 Component Description: All on-grade slab floors are assumed to be six-inch concrete poured directly onto the earth. The bottom of the slab is assumed to be at grade line. Monolithic and floating slabs are not differentiated.

Soil is assumed to have a conductivity of 0.75 Btu/hr•°F•ft<sup>2</sup>. Slabs two-feet or more below grade should use basement coefficients.

1003.3 Insulation Description: Coefficients are provided for the following three configurations:

Two-Foot (or four-foot) vertical: Insulation is applied directly to the slab exterior, extending downward from the top of the slab to a depth of two-feet (or four-feet) below grade.

Two-Foot (or four-foot) horizontal: Insulation is applied directly to the underside of the slab, and run horizontally from the perimeter inward for two-feet or four-feet. The slab edge is exposed in this configuration.

Note: A horizontal installation with a thermal break of at least R-5 at the slab edge should use the vertical-case F-factors.

Fully insulated slab: Insulation extends from the top of the slab, along the entire perimeter, and completely covers the area under the slab. Thicker perimeter insulation covers the slab edge and extends 2 feet under the slab.

**TABLE 10-2**  
**DEFAULT F-FACTORS FOR ON-GRADE SLABS**

Insulation type	R-0	R-5	R-10	R-15
<b>Unheated Slab</b>				
Uninsulated slab	0.73	—	—	—
2-ft Horizontal (No thermal break)	—	0.70	0.70	0.69
4-ft Horizontal (No thermal break)	—	0.67	0.64	0.63
2-ft Vertical	—	0.58	0.54	0.52
4-ft Vertical	—	0.54	0.48	0.45
Fully insulated slab	—	—	0.36	—
<b>Heated Slab</b>				
Uninsulated slab	0.84	—	—	—
Fully insulated slab	—	0.74	0.55	0.44
R-5 Center (With perimeter insulation)	—	—	0.66	0.62
R-10 Center (With perimeter insulation)	—	—	—	0.51
3-ft Vertical	—	—	0.78	—

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1003, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1003, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-1003, filed 12/19/90, effective 7/1/91.]

#### **WAC 51-11-1004 Section 1004: Floors over unconditioned space.**

1004.1 General: Tables 10-3, 10-4 and 10-4a list heat-loss coefficients for floors over unconditioned spaces in units of Btu/h • ft<sup>2</sup> • °F.

They are derived from procedures listed in RS-1, listed in Chapter 7, assuming an average outdoor temperature of 45°F, an average indoor temperature of 65°F, and a crawlspace area of 1350 ft<sup>2</sup> and 100 ft of perimeter. The crawlspace is assumed to be 2.5 feet high, with 24 inches below grade and 6 inches above grade.

1004.2 Crawlspace Description: Four configurations are considered: Vented crawlspace, unvented crawlspace, heated plenum crawlspace and exposed floor.

Vented crawlspaces: Assumed to have 3.0 air-changes per hour, with at least 1.0 ft<sup>2</sup> of net-free ventilation in the foundation for every three hundred ft<sup>2</sup> of crawlspace floor area. The crawlspace is not actively heated.

Floors over unheated areas, such as garages, may only use those values which have R-0 perimeter insulation.

Unvented crawlspaces: Assumed to have 1.5 air changes per hour, with less than 1.0 ft<sup>2</sup> of net-free ventilation in the foundation for every three hundred ft<sup>2</sup> of crawlspace floor area. The crawlspace is not actively heated. Floors over unheated basements may only use those values which have R-0 perimeter insulation.

Heated-plenum crawlspaces: Assumed to have 0.25 air-changes per hour, with no foundation vents. Heated supply air from central furnace is blown into a crawlspace and allowed to enter the living space unducted via holes cut into the floor.

Enclosed floors: Assumes no buffer space, and a covering of one-half inch of T1-11 on the exterior of the cavity exposed to the outside air or rigid insulation below a concrete floor, such as over parking garages.

1004.3 Construction Description: Floors are assumed to be either joisted floors framed on sixteen inch centers, or post and beam on four by eight foot squares. Insulation is assumed to be installed under the subflooring between the joists or beams with no space between the insulation and the subfloor. Insulation is assumed to be uncompressed. Exposed floors also include concrete with continuous rigid insulation assumed.

Perimeter insulation is assumed to extend from the top of the rim joist to the crawlspace floor and then inward along the ground (on top of the ground cover) for at least twenty-four inches.

Floor coverings are assumed to be light carpet with rubber pad.

**TABLE 10-3**  
**DEFAULT U-FACTORS FOR FLOORS OVER VENTED CRAWL-SPACE OR UNHEATED BASEMENT**

Nominal R-value		U-factor	
Floor	Perimeter	Post & Beam	Joists
0	0	0.112	0.134
	11	0.100	0.116
	19	0.098	0.114
	30	0.093	0.107
11	0	0.052	0.056
	11	0.048	0.052
19	0	0.038	0.041
	11	0.036	0.038
22	0	0.034	0.037
	11	0.033	0.035
25	0	0.032	0.034
	11	0.031	0.033
30	0	0.028	0.029
	11	0.027	0.028
38	0	0.024	0.025
	11	0.024	0.024

**TABLE 10-4**  
**DEFAULT U-FACTORS FOR FLOORS OVER HEATED PLENUM CRAWLSPACES**

Nominal R-value Perimeter	U-factor
11	0.085
19	0.075
30	0.069

**TABLE 10-4A**  
**EXPOSED FLOOR**

Nominal R-value	U-factor		
	Concrete	Wood Joist	Metal Joist
R-11	0.077	0.088	0.14
R-15	0.059	0.076	0.12
R-19	0.048	0.062	0.11
R-21	0.043	0.057	0.11
R-25	0.037	0.051	0.10
R-30	0.031	0.040	0.09
R-38	0.025	0.034	0.08

Note: Crawlspace used as heated plenums have approximately 30% higher heat-loss rate than unvented crawlspaces with the same assumed ACH. Default U-values in Table 10-4 reflect this higher rate of heat loss.

[Statutory Authority: RCW 19.27A.020, 19.27A.045, 04-01-106, § 51-11-1004, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1004, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1004, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-1004, filed 12/19/90, effective 7/1/91.]

### WAC 51-11-1005 Section 1005: Above-grade walls.

Section 1005.1 General: Table 10-5, 10-5A and 10-5B list heat-loss coefficients for the opaque portion of above-grade wood stud frame walls, metal stud frame walls and concrete masonry walls (Btu/h • ft<sup>2</sup> • °F) respectively. They

are derived from procedures listed in RS-1, listed in Chapter 7. For intermediate floor slabs which penetrate the insulated wall, use the concrete wall U-factors in Table 10-5B.

Insulation is assumed to uniformly fill the entire cavity and to be installed as per manufacturer's directions. All walls are assumed to be finished on the inside with one-half inch gypsum wallboard, and on the outside with either beveled wood siding over one-half inch plywood sheathing or with five-eighths inch T1-11 siding. Insulated sheathing (either interior or exterior) is assumed to cover the entire opaque wall surface.

1005.2 Framing Description: For wood stud frame walls, three framing types are considered, and defined as follows:

Standard: Studs framed on sixteen inch centers with double top plate and single bottom plate. Corners use three studs and each opening is framed using two studs. Headers consist of double 2X or single 4X material with an air space left between the header and the exterior sheathing. Interior partition wall/exterior wall intersections use two studs in the exterior wall.

Framing weighting factors:	Studs and plates	.19
	Insulated cavity	.77
	Headers	.04

Intermediate: Studs framed on sixteen inch centers with double top plate and single bottom plate. Corners use two studs or other means of fully insulating corners, and each opening is framed by two studs. Headers consist of double 2X material with R-10 insulation between the header and exterior sheathing. Interior partition wall/exterior wall intersections are fully insulated in the exterior wall.

Framing weighting factors:	Studs and plates	.18
	Insulated cavity	.78
	Headers	.04

Advanced: Studs framed on twenty-four inch centers with double top plate and single bottom plate. Corners use two studs or other means of fully insulating corners, and one stud is used to support each header. Headers consist of double 2X material with R-10 insulation between the header and exterior sheathing. Interior partition wall/exterior wall intersections are fully insulated in the exterior wall.

Framing weighting factors:	Studs and plates	.13
	Insulated cavity	.83
	Headers	.04

1005.3 Component Description: Default coefficients for four types of walls are listed: single-stud walls, metal stud walls, strap walls, and double-stud walls.

Single-Stud Wall: Assumes either 2x4 or 2x6 studs framed on sixteen or twenty-four inch centers. Headers are solid for 2x4 walls and double 2x for 2x6 walls, with either dead-air or rigid-board insulation in the remaining space.

Metal Stud Wall: Assumes metal studs spaced on 16 or 24 inch centers with insulation installed to fill wall cavities.

Continuous rigid board insulation is applied without creating uninsulated voids in the wall assembly.

Strap Wall: Assumes 2x6 studs framed on sixteen or twenty-four inch centers. 2x3 or 2x4 strapping is run horizontally along the interior surface of the wall to provide additional space for insulation.

Double-Stud Wall: Assumes an exterior structural wall and a separate interior, nonstructural wall. Insulation is placed in both wall cavities and in the space between the 2 walls. Stud spacing is assumed to be on 24 inch centers for both walls.

**TABLE 10-5  
DEFAULT U-FACTORS FOR ABOVE-GRADE WALLS**

**2 x 4 Single Wood Stud: R-11 Batt**

Siding Material/Framing Type				
	Lapped Wood		T1-11	
R-value of Foam Board	STD	ADV	STD	ADV
0	0.088	0.084	0.094	0.090
1	0.080	0.077	0.085	0.082
2	0.074	0.071	0.078	0.075
3	0.069	0.066	0.072	0.070
4	0.064	0.062	0.067	0.065
5	0.060	0.058	0.063	0.061
6	0.056	0.055	0.059	0.057
7	0.053	0.052	0.055	0.054
8	0.051	0.049	0.052	0.051
9	0.048	0.047	0.050	0.049
10	0.046	0.045	0.047	0.046
11	0.044	0.043	0.045	0.044
12	0.042	0.041	0.043	0.042

**NOTE:**

Nominal Batt R-value:  
R-11 at 3.5 inch thickness

Installed Batt R-value:  
R-11 in 3.5 inch cavity

**2 x 4 Single Wood Stud: R-13 Batt**

Siding Material/Framing Type				
	Lapped Wood		T1-11	
R-value of Foam Board	STD	ADV	STD	ADV
0	0.082	0.078	0.088	0.083
1	0.075	0.072	0.080	0.076
2	0.069	0.066	0.073	0.070
3	0.065	0.062	0.068	0.065
4	0.060	0.058	0.063	0.061
5	0.057	0.055	0.059	0.057
6	0.053	0.052	0.056	0.054
7	0.051	0.049	0.052	0.051
8	0.048	0.047	0.050	0.048
9	0.046	0.045	0.047	0.046
10	0.044	0.043	0.045	0.044
11	0.042	0.041	0.043	0.042
12	0.040	0.039	0.041	0.040

**NOTE:**

Nominal Batt R-value:  
R-13 at 3.63 inch thickness

Installed Batt R-value:  
R-12.7 in 3.5 inch cavity



**2 x 4 Single Wood Stud: R-15 Batt****NOTE:**

Nominal Batt R-value:  
R-15 at 3.5 inch thickness

Installed Batt R-value:  
R-15 in 3.5 inch cavity

Siding Material/Framing Type				
R-value of Foam Board	Lapped Wood		T1-11	
	STD	ADV	STD	ADV
0	0.076	0.071	0.081	0.075
1	0.069	0.065	0.073	0.069
2	0.064	0.061	0.068	0.069
3	0.060	0.057	0.063	0.059
4	0.056	0.053	0.059	0.056
5	0.053	0.051	0.055	0.052
6	0.050	0.048	0.052	0.050
7	0.047	0.046	0.049	0.047
8	0.045	0.044	0.047	0.045
9	0.043	0.042	0.044	0.043
10	0.041	0.040	0.042	0.041
11	0.039	0.038	0.041	0.039
12	0.038	0.037	0.039	0.038

**2 x 6 Single Wood Stud: R-19 Batt****NOTE:**

Nominal Batt R-value:  
R-19 at 6 inch thickness

Installed Batt R-value:  
R-18 in 5.5 inch cavity

Siding Material/Framing Type						
R-value of Foam Board	Lapped Wood			T1-11		
	STD	INT	ADV	STD	INT	ADV
0	0.062	0.058	0.055	0.065	0.061	0.058
1	0.058	0.055	0.052	0.060	0.057	0.055
2	0.054	0.052	0.050	0.056	0.054	0.051
3	0.051	0.049	0.047	0.053	0.051	0.049
4	0.048	0.046	0.045	0.050	0.048	0.046
5	0.046	0.044	0.043	0.048	0.046	0.044
6	0.044	0.042	0.041	0.045	0.044	0.042
7	0.042	0.040	0.039	0.043	0.042	0.040
8	0.040	0.039	0.038	0.041	0.040	0.039
9	0.038	0.037	0.035	0.039	0.038	0.037
10	0.037	0.036	0.035	0.038	0.037	0.036
11	0.036	0.035	0.034	0.036	0.035	0.035
12	0.034	0.033	0.033	0.035	0.034	0.033

**2 x 6 Single Wood Stud: R-21 Batt****NOTE:**

Nominal Batt R-value:  
R-21 at 5.5 inch thickness

Installed Batt R-value:  
R-21 in 5.5 inch cavity

Siding Material/Framing Type						
R-value of Foam Board	Lapped Wood			T1-11		
	STD	INT	ADV	STD	INT	ADV
0	0.057	0.054	0.051	0.060	0.056	0.053
1	0.054	0.051	0.048	0.056	0.053	0.050
2	0.050	0.048	0.045	0.052	0.050	0.047
3	0.048	0.045	0.043	0.049	0.047	0.045
4	0.045	0.043	0.041	0.047	0.045	0.043
5	0.043	0.041	0.040	0.044	0.042	0.041
6	0.041	0.039	0.038	0.042	0.041	0.039
7	0.039	0.038	0.036	0.040	0.039	0.037
8	0.038	0.036	0.035	0.039	0.037	0.036
9	0.036	0.035	0.034	0.037	0.036	0.035
10	0.035	0.034	0.033	0.036	0.035	0.033
11	0.033	0.033	0.032	0.034	0.033	0.032
12	0.032	0.031	0.031	0.033	0.032	0.031

**2 x 6 Single Wood Stud: R-22 Batt****NOTE:**

Nominal Batt R-value:  
R-22 at 6.75 inch thickness

Installed Batt R-value:  
R-20 in 5.5 inch cavity

Siding Material/Framing Type						
R-value of Foam Board	Lapped Wood			T1-11		
	STD	INT	ADV	STD	INT	ADV
0	0.059	0.055	0.052	0.062	0.058	0.054
1	0.055	0.052	0.049	0.057	0.054	0.051
2	0.052	0.049	0.047	0.054	0.051	0.048
3	0.049	0.046	0.044	0.050	0.048	0.046
4	0.046	0.044	0.042	0.048	0.046	0.044
5	0.044	0.042	0.041	0.045	0.043	0.042
6	0.042	0.040	0.039	0.043	0.042	0.040
7	0.040	0.039	0.037	0.041	0.040	0.038
8	0.038	0.037	0.036	0.039	0.038	0.037
9	0.037	0.036	0.035	0.038	0.037	0.035
10	0.035	0.034	0.033	0.036	0.035	0.034
11	0.034	0.033	0.032	0.035	0.034	0.033
12	0.033	0.032	0.031	0.034	0.033	0.032

**2 x 6 Single Wood Stud: Two R-11 Batts****NOTE:**

Nominal Batt R-value:  
R-22 at 7 inch thickness

Installed Batt R-value:  
R-18.9 in 5.5 inch cavity

Siding Material/Framing Type						
R-value of Foam Board	Lapped Wood			T1-11		
	STD	INT	ADV	STD	INT	ADV
0	0.060	0.057	0.054	0.063	0.059	0.056
1	0.056	0.053	0.051	0.059	0.056	0.053
2	0.053	0.050	0.048	0.055	0.052	0.050
3	0.050	0.048	0.046	0.052	0.049	0.047
4	0.047	0.045	0.044	0.049	0.047	0.045
5	0.045	0.043	0.042	0.046	0.045	0.043
6	0.043	0.041	0.040	0.044	0.043	0.041
7	0.041	0.040	0.038	0.042	0.041	0.039
8	0.039	0.038	0.037	0.040	0.039	0.038
9	0.038	0.037	0.036	0.039	0.038	0.036
10	0.036	0.035	0.034	0.037	0.036	0.035
11	0.035	0.034	0.033	0.036	0.035	0.034
12	0.034	0.033	0.032	0.034	0.034	0.033

**2 x 8 Single Stud: R-25 Batt****NOTE:**

Nominal Batt R-value:  
R-25 at 8 inch thickness

Installed Batt R-value:  
R-23.6 in 7.25 inch cavity

Siding Material/Framing Type						
R-value of Foam Board	Lapped Wood			T1-11		
	STD	INT	ADV	STD	INT	ADV
0	0.051	0.047	0.045	0.053	0.049	0.046
1	0.048	0.045	0.043	0.049	0.046	0.044
2	0.045	0.043	0.041	0.047	0.044	0.042
3	0.043	0.041	0.039	0.044	0.042	0.040
4	0.041	0.039	0.037	0.042	0.040	0.038
5	0.039	0.037	0.036	0.040	0.038	0.037
6	0.037	0.036	0.035	0.038	0.037	0.036
7	0.036	0.035	0.033	0.037	0.035	0.034
8	0.035	0.033	0.032	0.035	0.034	0.033
9	0.033	0.032	0.031	0.034	0.033	0.032
10	0.032	0.031	0.030	0.033	0.032	0.031
11	0.031	0.030	0.029	0.032	0.031	0.030
12	0.030	0.029	0.028	0.031	0.030	0.029

2 x 6: Strap Wall				
	Siding Material/Frame Type			
	Lapped Wood		T1-11	
	STD	ADV	STD	ADV
R-19 + R-11 Batts	0.036	0.035	0.038	0.036
R-19 + R-8 Batts	0.041	0.039	0.042	0.040

**2 x 6 + 2 x 4: Double Wood Stud**

<b>Batt Configuration</b>			<b>Siding Material/Frame Type</b>			
			<b>Lapped Wood</b>		<b>T1-11</b>	
<b>Exterior</b>	<b>Middle</b>	<b>Interior</b>	<b>STD</b>	<b>ADV</b>	<b>STD</b>	<b>ADV</b>
R-19	————	R-11	0.040	0.037	0.041	0.038
R-19	————	R-19	0.034	0.031	0.035	0.032
R-19	R-8	R-11	0.029	0.028	0.031	0.029
R-19	R-11	R-11	0.027	0.026	0.028	0.027
R-19	R-11	R-19	0.024	0.023	0.025	0.023
R-19	R-19	R-19	0.021	0.020	0.021	0.020

**2 x 4 + 2 x 4: Double Wood Stud**

<b>Batt Configuration</b>			<b>Siding Material/Frame Type</b>			
			<b>Lapped Wood</b>		<b>T1-11</b>	
<b>Exterior</b>	<b>Middle</b>	<b>Interior</b>	<b>STD</b>	<b>ADV</b>	<b>STD</b>	<b>ADV</b>
R-11	————	R-11	0.050	0.046	0.052	0.048
R-19	————	R-11	0.039	0.037	0.043	0.039
R-11	R-8	R-11	0.037	0.035	0.036	0.036
R-11	R-11	R-11	0.032	0.031	0.033	0.032
R-13	R-13	R-13	0.029	0.028	0.029	0.028
R-11	R-19	R-11	0.026	0.026	0.027	0.026

**Log Walls****NOTE:**

R-value of wood:  
R-1.25 per inch thickness

Average wall thickness  
90% average log diameter

<b>Average Log Diameter, Inches</b>	<b>U-factor</b>
6	0.148
8	0.111
10	0.089
12	0.074
14	0.063
16	0.056

**Stress Skin Panel****NOTE:**

R-value of expanded polystyrene: R-3.85 per inch

Framing: 6%  
Spline: 8%

No thermal bridging between interior and exterior splines

<b>Panel Thickness, Inches</b>	<b>U-factor</b>
3 1/2	0.071
5 1/2	0.048
7 1/4	0.037
9 1/4	0.030
11 1/4	0.025

**Metal Stud Walls:** The nominal R-values in Table 10-5A may be used for purposes of calculating metal stud wall section U-factors in lieu of the ASHRAE zone calculation method as provided in Chapter 25 of Standard RS-1.

**TABLE 10-5A**  
**Default U-factors for Overall Assembly Metal Stud Walls, Effective R-values for Metal Framing and Cavity Only, and**  
**Default Metal Building U-factors**

**OVERALL ASSEMBLY U-FACTORS FOR METAL STUD WALLS**

Metal Framing	R-Value of Continuous Foam Board Insulation	Cavity Insulation					
		R-0	R-11	R-13	R-15	R-19	R-21
16" o.c.	R-0 (none)	U-0.352	U-0.132	U-0.124	U-0.118	U-0.109	U-0.106
	R-1	U-0.260	U-0.117	U-0.111	U-0.106	U-0.099	U-0.096
	R-2	U-0.207	U-0.105	U-0.100	U-0.096	U-0.090	U-0.087
	R-3	U-0.171	U-0.095	U-0.091	U-0.087	U-0.082	U-0.080
	R-4	U-0.146	U-0.087	U-0.083	U-0.080	U-0.076	U-0.074
	R-5	U-0.128	U-0.080	U-0.077	U-0.074	U-0.071	U-0.069
	R-6	U-0.113	U-0.074	U-0.071	U-0.069	U-0.066	U-0.065
	R-7	U-0.102	U-0.069	U-0.066	U-0.065	U-0.062	U-0.061
	R-8	U-0.092	U-0.064	U-0.062	U-0.061	U-0.058	U-0.057
	R-9	U-0.084	U-0.060	U-0.059	U-0.057	U-0.055	U-0.054
	R-10	U-0.078	U-0.057	U-0.055	U-0.054	U-0.052	U-0.051
24" o.c.	R-0 (none)	U-0.338	U-0.116	U-0.108	U-0.102	U-0.094	U-0.090
	R-1	U-0.253	U-0.104	U-0.098	U-0.092	U-0.086	U-0.083
	R-2	U-0.202	U-0.094	U-0.089	U-0.084	U-0.079	U-0.077
	R-3	U-0.168	U-0.086	U-0.082	U-0.078	U-0.073	U-0.071
	R-4	U-0.144	U-0.079	U-0.075	U-0.072	U-0.068	U-0.066
	R-5	U-0.126	U-0.073	U-0.070	U-0.067	U-0.064	U-0.062
	R-6	U-0.112	U-0.068	U-0.066	U-0.063	U-0.060	U-0.059
	R-7	U-0.100	U-0.064	U-0.062	U-0.059	U-0.057	U-0.055
	R-8	U-0.091	U-0.060	U-0.058	U-0.056	U-0.054	U-0.052
	R-9	U-0.084	U-0.057	U-0.055	U-0.053	U-0.051	U-0.050
	R-10	U-0.077	U-0.054	U-0.052	U-0.050	U-0.048	U-0.048

**EFFECTIVE R-VALUES FOR METAL FRAMING AND CAVITY ONLY**

	Cavity		Insulation		
	Nominal Depth, Inches	Actual Depth, Inches	Nominal R-Value	Effective R-Value	
				16" O.C.	24" O.C.
Air Cavity	any	any	R-0.91 (air)	0.79	0.91
Wall	4	3-1/2	R-11	5.5	6.6
	4	3-1/2	R-13	6.0	7.2
	4	3-1/2	R-15	6.4	7.8
	6	5-1/2	R-19	7.1	8.6
	6	5-1/2	R-21	7.4	9.0
Roof	8	7-1/4	R-25	7.8	9.6
	Insulation is uncompressed		R-11	5.5	6.1
			R-19	7.0	9.1
			R-30	9.3	11.4

**DEFAULT METAL BUILDING U-FACTORS**

	R-10	R-11	R-13	R-19	R-24	R-30
Faced fiber glass blanket insulation rolled over and perpendicular to structural frame. Metal covering sheets fastened to the frame, holding insulation in place.	0.133	0.127	0.114	0.091	na	na
Faced fiber glass batt insulation suspended between structural frame. Metal covering sheets fastened directly to frame.	0.131	0.123	0.107	0.079	0.065	0.057
Faced fiber glass blanket insulation rolled over and perpendicular to structural frame. Rigid insulation blocks placed over insulation to align with structural frame.	0.102	0.096	0.084	0.065	na	na

	R-10	R-11	R-13	R-19	R-24	R-30
Faced fiber glass batt insulation suspended between structural frame. Rigid insulation blocks placed over insulation to align with structural frame.	0.099	0.093	0.080	0.059	0.048	0.041

**Concrete Masonry Walls:** The nominal R-values in Table 10-5B may be used for purposes of calculating concrete masonry wall section U-factors in lieu of the ASHRAE isothermal planes calculation method as provided in Chapter 25 of Standard RS-1.

**TABLE 10-5B**  
**Default U-Factors for Concrete and Masonry Walls**

8" CONCRETE MASONRY				
WALL DESCRIPTION	CORE TREATMENT			
	Partial Grout with UngROUTED Cores			Solid Grout
	Empty	Loose-fill insulated		
		Perlite	Vermiculite	
Exposed Block, Both Sides	0.40	0.23	0.24	0.43
R-5 Interior Insulation, Wood Furring	0.14	0.11	0.12	0.15
R-6 Interior Insulation, Wood Furring	0.14	0.11	0.11	0.14
R-10.5 Interior Insulation, Wood Furring	0.11	0.09	0.09	0.11
R-8 Interior Insulation, Metal Clips	0.11	0.09	0.09	0.11
R-6 Exterior Insulation	0.12	0.10	0.10	0.12
R-10 Exterior Insulation	0.08	0.07	0.07	0.08
R-9.5 Rigid Polystyrene Integral Insulation, Two Webbed Block	0.11	0.09	0.09	0.12

12" CONCRETE MASONRY				
	CORE TREATMENT			
	Partial Grout with UngROUTED Cores			Solid Grout
	Empty	Loose-fill insulated		
		Perlite	Vermiculite	
Exposed Block, Both Sides	0.35	0.17	0.18	0.33
R-5 Interior Insulation, Wood Furring	0.14	0.10	0.10	0.13
R-6 Interior Insulation, Wood Furring	0.13	0.09	0.10	0.13
R-10.5 Interior Insulation, Wood Furring	0.11	0.08	0.08	0.10
R-8 Interior Insulation, Metal Clips	0.10	0.08	0.08	0.09
R-6 Exterior Insulation	0.11	0.09	0.09	0.11
R-10 Exterior Insulation	0.08	0.06	0.06	0.08
R-9.5 Rigid Polystyrene Integral Insulation, Two Webbed Block	0.11	0.08	0.09	0.12

8" CLAY BRICK				
WALL DESCRIPTION	CORE TREATMENT			
	Partial Grout with UngROUTED Cores			Solid Grout
	Empty	Loose-fill insulated		
		Perlite	Vermiculite	
Exposed Block, Both Sides	0.50	0.31	0.32	0.56
R-5 Interior Insulation, Wood Furring	0.15	0.13	0.13	0.16
R-6 Interior Insulation, Wood Furring	0.15	0.12	0.12	0.15
R-10.5 Interior Insulation, Wood Furring	0.12	0.10	0.10	0.12
R-8 Interior Insulation, Metal Clips	0.11	0.10	0.10	0.11
R-6 Exterior Insulation	0.12	0.11	0.11	0.13
R-10 Exterior Insulation	0.08	0.08	0.08	0.09

6" CONCRETE POURED OR PRECAST				
WALL DESCRIPTION	CORE TREATMENT			
	Partial Grout with UngROUTED Cores			Solid Grout
	Empty	Loose-fill insulated		
		Perlite	Vermiculite	
Exposed Concrete, Both Sides	NA	NA	NA	0.61
R-5 Interior Insulation, Wood Furring	NA	NA	NA	0.16
R-6 Interior Insulation, Wood Furring	NA	NA	NA	0.15
R-10.5 Interior Insulation, Wood Furring	NA	NA	NA	0.12

6" CONCRETE POURED OR PRECAST				
WALL DESCRIPTION	CORE TREATMENT			
	Partial Grout with UngROUTED Cores			Solid Grout
	Empty	Loose-fill insulated		
		Perlite	Vermiculite	
R-8 Interior Insulation, Metal Clips	NA	NA	NA	0.12
R-6 Exterior Insulation	NA	NA	NA	0.13
R-10 Exterior Insulation	NA	NA	NA	0.09

## Peripheral Edges of Intermediate Concrete Floors

SLAB EDGE TREATMENT	AVERAGE THICKNESS OF WALL ABOVE AND BELOW			
	6 inches	8 inches	10 inches	12 inches
Exposed Concrete	0.816	0.741	0.678	0.625
R-5 Exterior Insulation	0.161	0.157	0.154	0.152
R-6 Exterior Insulation	0.138	0.136	0.134	0.132
R-7 Exterior Insulation	0.122	0.120	0.118	0.116
R-8 Exterior Insulation	0.108	0.107	0.106	0.104
R-9 Exterior Insulation	0.098	0.097	0.095	0.094
R-10 Exterior Insulation	0.089	0.088	0.087	0.086

## Notes for Default Table 10-5B

1. Grouted cores at 40" x 48" on center vertically and horizontally in partial grouted walls.
2. Interior insulation values include 1/2" gypsum board on the inner surface.
3. Furring and stud spacing is 16" on center. Insulation is assumed to fill furring space and is not compressed.
4. Intermediate values may be interpolated using this table. Values not contained in this table may be computed using the procedures listed in Standard RS-1.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1005, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045, 04-01-106, § 51-11-1005, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1005, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1005, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-1005, filed 12/19/90, effective 7/1/91.]

**WAC 51-11-1006 Section 1006 Default U-factors for glazing and doors.**

1006.1 Glazing and Doors without NFRC Certification: Glazing and doors that do not have NFRC certification shall be assigned the following U-factors:

**TABLE 10-6**  
**Other than Group R Occupancy: DEFAULT U-FACTORS**  
**FOR VERTICAL GLAZING, OVERHEAD GLAZING AND**  
**OPAQUE DOORS**

Vertical Glazing			
	U-Factor		
	Any Frame	Aluminum W/Thermal Break	Vinyl/Wood Frame
Single	1.45	1.45	1.45
Double	0.90	0.85	0.75
1/2 Inch Air, Fixed	0.75	0.70	0.60
1/2 Inch Air, Low-e <sup>(0.40)</sup> , Fixed	0.60	0.55	0.50
1/2 Inch Air, Low-e <sup>(0.10)</sup> , Fixed	0.55	0.50	0.45
1/2 Inch Argon, Low-e <sup>(0.10)</sup> , Fixed	0.50	0.45	0.40

The category for aluminum frame with a thermal break is as defined in footnote 7 to Table 10-6A.

Overhead Glazing: Sloped Glazing (Including Frame)			
	U-Factor		
	Any Frame	Aluminum W/Thermal Break	Vinyl/Wood Frame
Single	1.74	1.74	1.74
Double	1.08	1.02	0.90
1/2 Inch Air, Fixed	0.90	0.84	0.72
1/2 Inch Air, Low-e <sup>(0.40)</sup> , Fixed	0.72	0.66	0.60
1/2 Inch Air, Low-e <sup>(0.10)</sup> , Fixed	0.66	0.60	0.54
1/2 Inch Argon, Low-e <sup>(0.10)</sup> , Fixed	0.60	0.54	0.48

This default table is applicable to sloped glazing only. (Sloped glazing is a multiple-lite glazed system (similar to a curtain wall) that is mounted at a slope greater than 15° from the vertical plane.) Other overhead glazing shall use the defaults in Table 10-6E.

Opaque Doors	
	U-Factor
Uninsulated Metal	1.20

Opaque Doors	
	U-Factor
Insulated Metal (Including Fire Door and Smoke Vent)	0.60
Wood	0.50

## Notes:

Where a gap width is listed (i.e.: 1/2 inch), that is the minimum allowed.  
Where a low-emissivity emittance is listed (i.e.: 0.40, 0.20, 0.10), that is the maximum allowed.

Where a gas other than air is listed (i.e.: Argon), the gas fill shall be a minimum of 90%.

Where an operator type is listed (i.e.: Fixed), the default is only allowed for that operator type. Where a frame type is listed (i.e.: Wood/vinyl), the default is only allowed for that frame type. Wood/vinyl frame includes reinforced vinyl and aluminum-clad wood.

**TABLE 10-6A**  
**Group R Occupancy: DEFAULT U-FACTORS FOR VERTICAL GLAZING**

Description <sup>1,2,3,4</sup>			Frame Type <sup>5,6</sup>		
			Aluminum	Aluminum Thermal Break <sup>7</sup>	Wood/Vinyl
Windows	Single		1.20	1.20	1.20
	Double, < 1/2"	Clear	0.92	0.75	0.63
		Clear + Argon	0.87	0.71	0.60
		Low-e	0.85	0.69	0.58
		Low-e + Argon	0.79	0.62	0.53
	Double, ≥ 1/2"	Clear	0.86	0.69	0.58
		Clear + Argon	0.83	0.67	0.55
		Low-e	0.78	0.61	0.51
		Low-e + Argon	0.75	0.58	0.48
	Triple,	Clear	0.70	0.53	0.43
		Clear + Argon	0.69	0.52	0.41
		Low-e	0.67	0.49	0.40
		Low-e + Argon	0.63	0.47	0.37
Garden Windows	Single		2.60	n.a.	2.31
	Double	Clear	1.81	n.a.	1.61
		Clear + Argon	1.76	n.a.	1.56
		Low-e	1.73	n.a.	1.54
		Low-e + Argon	1.64	n.a.	1.47

- 1 <1/2" = a minimum dead air space of less than 0.5 inches between the panes of glass.  
≥ 1/2" = a minimum dead air space of 0.5 inches or greater between the panes of glass.  
Where no gap width is listed, the minimum gap width is 1/4".
- 2 Any low-e (emissivity) coating (0.1, 0.2 or 0.4).
- 3 U-factors listed for argon shall consist of sealed, gas-filled insulated units for argon, CO<sub>2</sub>, SF<sub>6</sub>, argon/SF<sub>6</sub> mixtures and Krypton.
- 4 "Glass block" assemblies may use a U-factor of 0.51.
- 5 Insulated fiberglass framed products shall use wood/vinyl U-factors.
- 6 Aluminum clad wood windows shall use the U-factors listed for wood/vinyl windows.
- 7 Aluminum Thermal Break = An aluminum thermal break framed window shall incorporate the following minimum design characteristics:
  - a) The thermal conductivity of the thermal break material shall be not more than 3.6 Btu-in/h/ft<sup>2</sup>/°F;
  - b) The thermal break material must produce a gap in the frame material of not less than 0.210 inches; and,
  - c) All metal framing members of the products exposed to interior and exterior air shall incorporate a thermal break meeting the criteria in a) and b) above.

**TABLE 10-6B<sup>1</sup>**  
**Group R Occupancy: SMALL BUSINESS COMPLIANCE TABLE FOR VERTICAL GLAZING**

DESCRIPTION <sup>2,3,4,6</sup>	FRAME TYPE <sup>7,8</sup>			
	ALUMINUM	ALUM. THERMAL BREAK <sup>9</sup>	WOOD/VINYL	ALUM. CLAD WOOD/REINFORCED VINYL <sup>10</sup>
Double, Clear 1/4"	0.82	0.66	0.56	0.59
Double, Clear 1/4" + argon	0.77	0.63	0.53	0.56
Double, Low-e4 1/4"	0.76	0.61	0.52	0.54
Double, Low-e2 1/4"	0.73	0.58	0.49	0.51
Double, Low-e1 1/4"	0.70	0.55	0.47	0.49

**TABLE 10-6B<sup>1</sup>**  
**Group R Occupancy: SMALL BUSINESS COMPLIANCE TABLE FOR VERTICAL GLAZING**

DESCRIPTION <sup>2,3,4,6</sup>	FRAME TYPE <sup>7,8</sup>			
	ALUMINUM	ALUM. THERMAL BREAK <sup>9</sup>	WOOD/VINYL	ALUM. CLAD WOOD/REINFORCED VINYL <sup>10</sup>
Double, Low-e4 1/4" + argon	0.70	0.55	0.47	0.49
Double, Low-e2 1/4" + argon	0.66	0.52	0.43	0.46
Double, Low-e1 1/4" + argon	0.64	0.50	0.41	0.43
Double, Clear 3/8"	0.78	0.63	0.54	0.57
Double, Clear 3/8" + argon	0.75	0.60	0.51	0.54
Double, Low-e4 3/8"	0.72	0.57	0.48	0.51
Double, Low-e2 3/8"	0.69	0.54	0.45	0.48
Double, Low-e1 3/8"	0.66	0.51	0.43	0.46
Double, Low-e4 3/8" + argon	0.68	0.53	0.44	0.47
Double, Low-e2 3/8" + argon	0.63	0.49	0.41	0.44
Double, Low-e1 3/8" + argon	0.61	0.47	0.35	0.41
Double, Clear 1/2"	0.75	0.60	0.50	0.54
Double, Clear 1/2" + argon	0.72	0.58	0.48	0.51
Double, Low-e4 1/2"	0.68	0.53	0.44	0.47
Double, Low-e2 1/2"	0.64	0.50	0.40	0.44
Double, Low-e1 1/2"	0.61	0.47	0.35 <sup>5</sup>	0.42
Double, Low-e4 1/2" + argon	0.65	0.50	0.42	0.44
Double, Low-e2 1/2" + argon	0.60	0.46	0.37	0.40
Double, Low-e1 1/2" + argon	0.58	0.43	0.34	0.38
Triple, Clear 1/4"	0.66	0.52	0.42	0.44
Triple, Clear 1/4" + argon	0.63	0.49	0.39	0.42
Triple, Low-e4 1/4"	0.64	0.50	0.40	0.40
Triple, Low-e2 1/4"	0.62	0.48	0.39	0.41
Triple, Low-e1 1/4"	0.61	0.47	0.38	0.40
Triple, Low-e4 1/4" + argon	0.60	0.46	0.37	0.39
Triple, Low-e2 1/4" + argon	0.58	0.43	0.34	0.37
Triple, Low-e1 1/4" + argon	0.57	0.42	0.34	0.36
Triple, Clear 1/2"	0.61	0.46	0.37	0.40
Triple, Clear 1/2" + argon	0.59	0.45	0.36	0.38
Triple, Low-e4 1/2"	0.58	0.43	0.35	0.37
Triple, Low-e2 1/2"	0.55	0.41	0.32	0.35
Triple, Low-e1 1/2"	0.54	0.39	0.31	0.33
Triple, Low-e4 1/2" + argon	0.55	0.41	0.32	0.35
Triple, Low-e2 1/2" + argon	0.52	0.38	0.30	0.32
Triple, Low-e1 1/2" + argon	0.51	0.37	0.29	0.31

## Footnotes to Table 10-6B

- Subtract 0.02 from the listed default U-factor for nonaluminum spacer. Acceptable spacer materials may include but is not limited to fiberglass, wood and butyl or other material with an equivalent thermal performance.
- 1/4" = a minimum dead air space of 0.25 inches between the panes of glass.  
3/8" = a minimum dead air space of 0.375 inches between the panes of glass.  
1/2" = a minimum dead air space of 0.5 inches between the panes of glass.  
Product with air spaces different than those listed above shall use the value for the next smaller air space; i.e. 3/4 inch = 1/2 inch U-factors, 7/16 inch = 3/8 inch U-factors, 5/16 inch = 1/4 inch U-factors.
- Low-e4 (emissivity) shall be 0.4 or less.  
Low-e2 (emissivity) shall be 0.2 or less.  
Low-e1 (emissivity) shall be 0.1 or less.
- U-factors listed for argon shall consist of sealed, gas-filled insulated units for argon, CO<sub>2</sub>, SF<sub>6</sub>, and argon/SF<sub>6</sub> mixtures. The following conversion factor shall apply to Krypton gas-filled units: 1/4" or greater with krypton is equivalent to 1/2" argon.
- For this assembly only, products shall be deemed to comply if they have an emissivity of 0.16 or less.
- "Glass block" assemblies may use a U-factor of 0.51.



- 7 Insulated fiberglass framed products shall use wood/vinyl U-factors.
- 8 Subtract 0.02 from the listed default values for solariums.
- 9 Aluminum Thermal Break = An aluminum thermal break framed window shall incorporate the following minimum design characteristics:
  - a) The thermal conductivity of the thermal break material shall be not more than 3.6 Btu-in/h/ft<sup>2</sup>/F°;
  - b) The thermal break material must produce a gap in the frame material of not less than 0.210 inches; and,
  - c) All metal framing members of the products exposed to interior and exterior air shall incorporate a thermal break meeting the criteria in a) and b) above.
- 10 Aluminum clad wood windows shall use the U-factors listed for Aluminum Clad Wood/Reinforced Vinyl windows. Vinyl clad wood window shall use the U-factors listed for Wood/Vinyl windows. Any vinyl frame window with metal reinforcement in more than one rail shall use the U-factors listed for Aluminum Clad Wood/Reinforced Vinyl window.

**TABLE 10-6C**  
**Group R Occupancy: DEFAULT U-FACTORS FOR DOORS**

<b>Door Type</b>	<b>No Glazing</b>	<b>Single Glazing</b>	<b>Double Glazing with 1/4 in. Airspace</b>	<b>Double Glazing with 1/2 in. Airspace</b>	<b>Double Glazing with e = 0.10, 1/2 in. Argon</b>
<b>SWINGING DOORS (Rough opening - 38 in. x 82 in.)</b>					
<i>Slab Doors</i>					
Wood slab in wood frame <sup>a</sup>	0.46				
6% glazing (22 in. x 8 in. lite)	-	0.48	0.47	0.46	0.44
25% glazing (22 in. x 36 in. lite)	-	0.58	0.48	0.46	0.42
45% glazing (22 in. x 64 in. lite)	-	0.69	0.49	0.46	0.39
More than 50% glazing		Use Table 10-6A			
Insulated steel slab with wood edge in wood frame <sup>a</sup>	0.16				
6% glazing (22 in. x 8 in. lite)	-	0.21	0.20	0.19	0.18
25% glazing (22 in. x 36 in. lite)	-	0.39	0.28	0.26	0.23
45% glazing (22 in. x 64 in. lite)	-	0.58	0.38	0.35	0.26
More than 50% glazing		Use Table 10-6A			
Foam insulated steel slab with metal edge in steel frame <sup>b</sup>	0.37				
6% glazing (22 in. x 8 in. lite)	-	0.44	0.42	0.41	0.39
25% glazing (22 in. x 36 in. lite)	-	0.55	0.50	0.48	0.44
45% glazing (22 in. x 64 in. lite)	-	0.71	0.59	0.56	0.48
More than 50% glazing		Use Table 10-6A			
Cardboard honeycomb slab with metal edge in steel frame <sup>b</sup>	0.61				
<i>Style and Rail Doors</i>					
Sliding glass doors/French doors		Use Table 10-6A			
<i>Site-Assembled Style and Rail Doors</i>					
Aluminum in aluminum frame	-	1.32	0.99	0.93	0.79
Aluminum in aluminum frame with thermal break	-	1.13	0.80	0.74	0.63
<b>REVOLVING DOORS (Rough opening - 82 in. x 84 in.)</b>					
Aluminum in aluminum frame					
Open	-	1.32	-	-	-
Closed	-	0.65	-	-	-
<b>SECTIONAL OVERHEAD DOORS (Nominal - 10 ft x 10 ft)</b>					
Uninsulated steel (nominal U = 1.15) <sup>c</sup>	1.15	-	-	-	-
Insulated steel (nominal U = 0.11) <sup>c</sup>	0.24	-	-	-	-
Insulated steel with thermal break (nominal U = 0.08) <sup>c</sup>	0.13	-	-	-	-
a.	Thermally broken sill (add 0.03 for nonthermally broken sill)				
b.	Nonthermally broken sill				
c.	Nominal U-factors are through the center of the insulated panel before consideration of thermal bridges around the edges of the door sections and due to the frame.				

TABLE 10-6D  
Group R Occupancy: DEFAULT U-FACTORS FOR GLAZED DOORS  
See Table 10-6C

TABLE 10-6E  
Group R Occupancy: DEFAULT U-FACTORS FOR OVERHEAD GLAZING

Glazing Type	Frame Type			
	Aluminum without Thermal Break	Aluminum with Thermal Break	Reinforced Vinyl/ Aluminum-Clad Wood or Vinyl	Wood or Vinyl-Clad Wood/ Vinyl without Reinforcing
Single Glazing				
glass	U-1.58	U-1.51	U-1.40	U-1.18
acrylic/polycarb	U-1.52	U-1.45	U-1.34	U-1.11
Double Glazing				
air	U-1.05	U-0.89	U-0.84	U-0.67
argon	U-1.02	U-0.86	U-0.80	U-0.64
Double Glazing, $e = 0.20$				
air	U-0.96	U-0.80	U-0.75	U-0.59
argon	U-0.91	U-0.75	U-0.70	U-0.54
Double Glazing, $e = 0.10$				
air	U-0.94	U-0.79	U-0.74	U-0.58
argon	U-0.89	U-0.73	U-0.68	U-0.52
Double Glazing, $e = 0.05$				
air	U-0.93	U-0.78	U-0.73	U-0.56
argon	U-0.87	U-0.71	U-0.66	U-0.50
Triple Glazing				
air	U-0.90	U-0.70	U-0.67	U-0.51
argon	U-0.87	U-0.69	U-0.64	U-0.48
Triple Glazing, $e = 0.20$				
air	U-0.86	U-0.68	U-0.63	U-0.47
argon	U-0.82	U-0.63	U-0.59	U-0.43
Triple Glazing, $e = 0.20$ on 2 surfaces				
air	U-0.82	U-0.64	U-0.60	U-0.44
argon	U-0.79	U-0.60	U-0.56	U-0.40
Triple Glazing, $e = 0.10$ on 2 surfaces				
air	U-0.81	U-0.62	U-0.58	U-0.42
argon	U-0.77	U-0.58	U-0.54	U-0.38
Quadruple Glazing, $e = 0.10$ on 2x surfaces				
air	U-0.78	U-0.59	U-0.55	U-0.39
argon	U-0.74	U-0.56	U-0.52	U-0.36
krypton	U-0.70	U-0.52	U-0.48	U-0.32

1. U-factors are applicable to both glass and plastic, flat and domed units, all spacers and gaps.
2. Emissivities shall be less than or equal to the value specified.
3. Gap fill shall be assumed to be air unless there is a minimum of 90% argon or krypton.
4. Aluminum frame with thermal break is as defined in footnote 9 to Table 10-6B.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1006, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1006, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1006, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-1006, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1006, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-1006, filed 2/10/94, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1006, filed 12/19/90, effective 7/1/91.]

### WAC 51-11-1007 Section 1007 Ceilings.

1007.1 General: Table 10-7 lists heat-loss coefficients for the opaque portion of exterior ceilings below vented attics, vaulted ceilings, and roof decks in units of Btu/h•ft²•°F of ceiling.

They are derived from procedures listed in Standard RS-1, listed in Chapter 7. Ceiling U-factors are modified for the (2007 Ed.)

buffering effect of the attic, assuming an indoor temperature of 65° F and an outdoor temperature of 45°F.

**Metal Framed Ceilings:** The nominal R-values in Table 10-5A - EFFECTIVE R-VALUES FOR METAL FRAMING AND CAVITY ONLY may be used for purposes of calculating metal framed ceiling section U-factors in lieu of the ASHRAE zone calculation method as provided in Chapter 25 of Standard RS-1.

1007.2 Component Description: The four types of ceilings are characterized as follows:

**Ceilings Below a Vented Attic:** Attic insulation is assumed to be blown-in, loose-fill fiberglass with a K-value of  $2.6 \text{ hr} \cdot \text{ft}^2 \cdot ^\circ\text{F}/\text{Btu}$  per inch. Full bag count for specified R-value is assumed in all cases. Ceiling dimensions for flat ceiling calculations are forty-five by thirty feet, with a gabled roof having a 4/12 pitch. The attic is assumed to vent naturally at the rate of three air changes per hour through soffit and ridge vents. A void fraction of 0.002 is assumed for all attics with insulation baffles. Standard-framed, un baffled attics assume a void fraction of 0.008.

Attic framing is either standard or advanced. Standard framing assumes tapering of insulation depth around the perimeter with resultant decrease in thermal resistance. An increased R-value is assumed in the center of the ceiling due to the effect of piling leftover insulation. Advanced framing assumes full and even depth of insulation extending to the outside edge of exterior walls. Advanced framing does not change from the default value.

U-factors for flat ceilings below vented attics with standard framing may be modified with the following table:

Roof Pitch	U-Factor for Standard Framing	
	R-30	R-38
4/12	.036	.031
5/12	.035	.030
6/12	.034	.029
7/12	.034	.029
8/12	.034	.028

Roof Pitch	U-Factor for Standard Framing	
	R-30	R-38
9/12	.034	.028
10/12	.033	.028
11/12	.033	.027
12/12	.033	.027

Vented scissors truss attics assume a ceiling pitch of 2/12 with a roof pitch of either 4/12 or 5/12. Unbaffled standard framed scissors truss attics are assumed to have a void fraction of 0.016.

**Vaulted Ceilings:** Insulation is assumed to be fiberglass batts installed in roof joist cavities. In the vented case, at least 1.5-inches between the top of the batts and the underside of the roof sheathing is left open for ventilation in each cavity. A ventilation rate of 3.0 air changes per hour is assumed. In the unvented or dense pack case, the ceiling cavity is assumed to be fully packed with insulation, leaving no space for ventilation.

**Roof Decks:** Rigid insulation is applied to the top of roof decking with no space left for ventilation. Roofing materials are attached directly on top of the insulation. Framing members are often left exposed on the interior side.

**Metal Truss Framing:** Overall system tested values for the roof/ceiling  $U_o$  for metal framed truss assemblies from approved laboratories shall be used, when such data is acceptable to the building official.

Alternatively, the  $U_o$  for roof/ceiling assemblies using metal truss framing may be obtained from Tables 10-7A, 10-7B, 10-7C, 10-7D and 10-7E.

**TABLE 10-7  
DEFAULT U-FACTORS FOR CEILINGS**

#### Ceilings Below Vented Attics

	Standard Frame	Advanced Frame
<b>Flat Ceiling</b>	<b>Baffled</b>	
R-19	0.049	0.047
R-30	0.036	0.032
R-38	0.031	0.026
R-49	0.027	0.020
R-60	0.025	0.017
<b>Scissors Truss</b>		
R-30 (4/12 roof pitch)	0.043	0.031
R-38 (4/12 roof pitch)	0.040	0.025
R-49 (4/12 roof pitch)	0.038	0.020
R-30 (5/12 roof pitch)	0.039	0.032
R-38 (5/12 roof pitch)	0.035	0.026
R-49 (5/12 roof pitch)	0.032	0.020
<b>Vaulted Ceilings</b>		
	<b>16" O.C.</b>	<b>24" O.C.</b>
<b>Vented</b>		
R-19 2x10 joist	0.049	0.048
R-30 2x12 joist	0.034	0.033
R-38 2x14 joist	0.027	0.027
<b>Unvented</b>		
R-30 2x10 joist	0.034	0.033
R-38 2x12 joist	0.029	0.027
R-21 + R-21 2x12 joist	0.026	0.025

			Standard Frame	Advanced Frame
<b>Roof Deck</b>				
			<b>4x Beams, 48" O.C.</b>	
R-12.5	2"	Rigid insulation	0.064	
R-21.9	3.5"	Rigid insulation	0.040	
R-37.5	6"	Rigid insulation	0.025	
R-50	8"	Rigid insulation	0.019	

Table 10-7A Steel Truss <sup>1</sup> Framed Ceiling U <sub>O</sub>													
Cavity R-value	Truss Span (ft)												
	12	14	16	18	20	22	24	26	28	30	32	34	36
19	0.1075	0.0991	0.0928	0.0878	0.0839	0.0807	0.0780	0.0757	0.0737	0.0720	0.0706	0.0693	0.0681
30	0.0907	0.0823	0.0760	0.0710	0.0671	0.0638	0.0612	0.0589	0.0569	0.0552	0.0538	0.0525	0.0513
38	0.0844	0.0759	0.0696	0.0647	0.0607	0.0575	0.0548	0.0525	0.0506	0.0489	0.0474	0.0461	0.0449
49	0.0789	0.0704	0.0641	0.0592	0.0552	0.0520	0.0493	0.0470	0.0451	0.0434	0.0419	0.0406	0.0395

Table 10-7B Steel Truss <sup>1</sup> Framed Ceiling U <sub>O</sub> with R-3 Sheathing <sup>2</sup>													
Cavity R-value	Truss Span (ft)												
	12	14	16	18	20	22	24	26	28	30	32	34	36
19	0.0809	0.0763	0.0728	0.0701	0.0679	0.0661	0.0647	0.0634	0.0623	0.0614	0.0606	0.0599	0.0592
30	0.0641	0.0595	0.0560	0.0533	0.0511	0.0493	0.0478	0.0466	0.0455	0.0446	0.0438	0.0431	0.0424
38	0.0577	0.0531	0.0496	0.0469	0.0447	0.0430	0.0415	0.0402	0.0392	0.0382	0.0374	0.0367	0.0361
49	0.0523	0.0476	0.0441	0.0414	0.0393	0.0375	0.0360	0.0348	0.0337	0.0328	0.0319	0.0312	0.0306

Table 10-7C Steel Truss <sup>1</sup> Framed Ceiling U <sub>O</sub> with R-5 Sheathing <sup>2</sup>													
Cavity R-value	Truss Span (ft)												
	12	14	16	18	20	22	24	26	28	30	32	34	36
19	0.0732	0.0697	0.0670	0.0649	0.0633	0.0619	0.0608	0.0598	0.0590	0.0583	0.0577	0.0571	0.0567
30	0.0564	0.0529	0.0502	0.0481	0.0465	0.0451	0.0440	0.0430	0.0422	0.0415	0.0409	0.0403	0.0399
38	0.0501	0.0465	0.0438	0.0418	0.0401	0.0388	0.0376	0.0367	0.0359	0.0351	0.0345	0.0340	0.0335
49	0.0446	0.0410	0.0384	0.0363	0.0346	0.0333	0.0322	0.0312	0.0304	0.0297	0.0291	0.0285	0.0280

Table 10-7D Steel Truss <sup>1</sup> Framed Ceiling U <sub>O</sub> with R-10 Sheathing <sup>2</sup>													
Cavity R-value	Truss Span (ft)												
	12	14	16	18	20	22	24	26	28	30	32	34	36
19	0.0626	0.0606	0.0590	0.0578	0.0569	0.0561	0.0555	0.0549	0.0545	0.0541	0.0537	0.0534	0.0531
30	0.0458	0.0437	0.0422	0.0410	0.0401	0.0393	0.0387	0.0381	0.0377	0.0373	0.0369	0.0366	0.0363
38	0.0394	0.0374	0.0359	0.0347	0.0337	0.0330	0.0323	0.0318	0.0313	0.0309	0.0305	0.0302	0.0299
49	0.0339	0.0319	0.0304	0.0292	0.0283	0.0275	0.0268	0.0263	0.0258	0.0254	0.0251	0.0247	0.0245

Table 10-7E Steel Truss <sup>1</sup> Framed Ceiling U <sub>O</sub> with R-15 Sheathing <sup>2</sup>													
Cavity R-value	Truss Span (ft)												
	12	14	16	18	20	22	24	26	28	30	32	34	36
19	0.0561	0.0550	0.0541	0.0535	0.0530	0.0526	0.0522	0.0519	0.0517	0.0515	0.0513	0.0511	0.0509
30	0.0393	0.0382	0.0373	0.0367	0.0362	0.0358	0.0354	0.0351	0.0349	0.0347	0.0345	0.0343	0.0341
38	0.0329	0.0318	0.0310	0.0303	0.0298	0.0294	0.0291	0.0288	0.0285	0.0283	0.0281	0.0279	0.0278
49	0.0274	0.0263	0.0255	0.0249	0.0244	0.0239	0.0236	0.0233	0.0230	0.0228	0.0226	0.0225	0.0223

1 - Assembly values based on 24 inch on center truss spacing; 11 Truss member connections penetrating insulation (4 at the eaves, 7 in the interior space); 1/2 inch drywall ceiling; all truss members are 2x4 "C" channels with a solid web.

2 - Ceiling sheathing installed between bottom chord and drywall.

[Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1007, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1007, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1007, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1007, filed 12/19/90, effective 7/1/91.]

### WAC 51-11-1008 Section 1008 Air infiltration.

1008.1 General: Tables 10-8 and 10-8A list effective air change rates and heat capacities for heat loss due to infiltration for Group R Occupancy.

Estimated seasonal average infiltration rate in air changes per hour (ACH) is given for standard air-leakage control (see section 502.4 of this code for air leakage requirements for Group R Occupancy). The effective air-change rate

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shall be used in calculations for compliance under either the Component Performance or Systems Analysis approaches.

Heat loss due to infiltration shall be computed using the following equation:

$$Q_{\text{infil}} = \text{ACH}_{\text{eff}} * \text{HCP}$$

where:  $Q_{\text{infil}}$  = Heat loss due to air infiltration  
 $\text{ACH}_{\text{eff}}$  = the effective air infiltration rate in Table 10-8

HCP = the Heat Capacity Density Product for the appropriate elevation or climate zone as given below.

**TABLE 10-8  
ASSUMED EFFECTIVE AIR CHANGES  
PER HOUR**

<b>Air-Leakage Control Package</b>	<b>Air Changes per Hour</b>	
	<b>Natural</b>	<b>Effective</b>
Standard	0.35	0.35

**TABLE 10-8A  
DEFAULT HEAT CAPACITY/DENSITY PRODUCT FOR AIR**

<b>Zone</b>	<b>Average Elevation</b>	<b>Heat Capacity/Density</b>
1	Mean Sea Level	0.0180 Btu/h • °F
2	2000	0.0168 Btu/h • °F
3	3000	0.0162 Btu/h • °F

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1008, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1008, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-1008, filed 12/19/90, effective 7/1/91.]

### WAC 51-11-1009 Section 1009 Mass.

1009.1 General: Tables 10-9 and 10-10 list default mass values for concrete masonry construction. Calculations are based on standard ASHRAE values for heat-storage capacity as listed in Standard RS-1, Chapter 25.

Thermal capacity of furniture is ignored, as is heat storage beyond the first four inches of mass thickness. All mass is assumed to be in direct contact with the conditioned space. Concrete separated from the heated volume by other materials must multiply the listed concrete mass value by the result of the following formula:

$$\text{Ln(R-value)} \times (-.221) + 0.5$$

Where:

Ln = Natural log

R-value = R-value of material covering concrete

Note: All default values for covered concrete slabs have been adjusted according to this procedure.

1009.2 Mass Description: Mass is divided into two types: Structural and additional.

**Structural Mass:** Includes heat-storage capacity of all standard building components of a typical residential structure, including floors, ceilings, and interior and exterior walls in Btu/ft<sup>2</sup>•°F of floor area. It also assumes exterior wall, interior wall and ceiling surface area approximately equals three times the floor area.

**Additional Mass:** Includes any additional building material not part of the normal structure, which is added specifically to increase the building's thermal-storage capability. This category includes masonry fireplaces, water or trombe walls, and extra layers of sheetrock. Coefficients are in Btu/ft<sup>2</sup>•°F of surface area of material exposed to conditioned space. The coefficient for water is Btu/°F • gallon.

1009.3 Component Description: Light frame assumes one inch thick wood flooring with five-eighths inch sheetrock on ceilings and interior walls, and walls consisting of either five-eighths inch sheetrock or solid logs. Slab assumes a four-inch concrete slab on or below grade, with five-eighths inch sheetrock on exterior and interior walls and ceiling, and with separate values for interior or exterior wall insulation. Adjustments for slab covering is based on R-value of material. Additional mass values are based on the density multiplied by the specific heat of the material adjusted for listed thickness.

**TABLE 10-9  
HEAT CAPACITY**

	<b>Partial Grout</b>	<b>Solid Grout</b>
8" CMU	9.65	15.0
12" CMU	14.5	23.6
8" Brick	10.9	16.4
6" Concrete	NA	14.4

**TABLE 10-10  
DEFAULT MASS VALUES**

<b>Structural Mass M-value</b>	<b>Btu/ft<sup>2</sup> • °F floor area</b>
<b>Light Frame:</b>	
Joisted/post & beam floor, sheetrock walls and ceilings	3.0
Joisted/post & beam floor, log walls, sheetrock ceilings	4.0
<b>Slab With Interior Wall Insulation:</b>	
Slab, no covering or tile, sheetrock walls and ceilings	10.0
Slab, hardwood floor covering, sheetrock walls and ceilings	7.0
Slab, carpet and pad, sheetrock walls and ceilings	5.0
<b>Slab With Exterior Wall Insulation:</b>	
Slab, no covering or tile, sheetrock walls and ceilings	12.0
Slab, hardwood floor covering, sheetrock walls and ceilings	9.0
Slab, carpet and pad, sheetrock walls and ceilings	7.0

**Structural Mass M-value****Btu/ft<sup>2</sup> • °F floor area****Additional Mass M-Value:****Btu/ft<sup>2</sup> • °F surface area**

Gypsum wallboard, 1/2 inch thickness	0.54
Gypsum wallboard, 5/8 inch thickness	0.68
Hardwood floor	1.40
Concrete/Brick, 4 inch-thickness	10.30
Concrete/Brick, 6 inch-thickness	15.40

Water, 1 gallon

**Btu/°F • gallon**  
8.0

[Statutory Authority: RCW 19.27A.020, 19.27A.045, 04-01-106, § 51-11-1009, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1009, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1009, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-1009, filed 12/19/90, effective 7/1/91.]

## CHAPTER 11 ADMINISTRATION AND ENFORCEMENT

**WAC 51-11-1100 Title.** Chapters 11 through 20 of this Code shall be known as the "Washington State Nonresidential Energy Code" and may be cited as such; and will be referred to hereafter as "this Code."

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1100, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1110 Purpose and intent.** The purpose of this Code is to provide minimum standards for new or altered buildings and structures or portions thereof to achieve efficient use and conservation of energy. It is intended that these provisions provide flexibility to permit the use of innovative approaches and techniques to achieve efficient use and conservation of energy.

The purpose of this Code is not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefitted by the terms of this Code. This Code is not intended to abridge any safety or health requirements required under any other applicable codes or ordinances.

The provisions of this Code do not consider the efficiency of various energy forms as they are delivered to the building envelope.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1110, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1120 Scope.** This Code sets forth minimum requirements for the design of new or altered buildings and structures or portions thereof that provide facilities or shelter for public assembly, educational, business, mercantile, institutional, storage, factory, and industrial occupancies by regulating their exterior envelopes and the selection of their HVAC, service water heating, electrical distribution and illuminating systems and equipment for efficient use and conservation of energy.

**EXCEPTION:** The provisions of this code do not apply to temporary growing structures used solely for the commercial production of horticultural plants including ornamental plants, flowers, vegetables, and fruits. "Temporary growing structure" means a structure that has the sides and roof covered with polyethylene, polyvinyl, or similar flexible synthetic material and is used to provide plants with either frost protection or increased heat retention. A temporary growing structure is not considered a building for purposes of this code.

[Statutory Authority: RCW 19.27A.025 and 19.27A.045, 98-03-003, § 51-11-1120, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1120, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1130 Application to existing buildings.** Additions, alterations or repairs, changes of occupancy or use, or historic buildings that do not comply with the requirements for new buildings, shall comply with the requirements in Sections 1130 through 1134 as applicable.

**EXCEPTION:** The building official may approve designs of alterations or repairs which do not fully conform with all of the requirements of Sections 1130 through 1134 where in the opinion of the building official full compliance is physically impossible and/or economically impractical and the alteration or repair improves the energy efficiency of the building.

In no case shall energy code requirements be less than those requirements in effect at the time of the initial construction of the building.

[Statutory Authority: RCW 19.27A.025 and 19.27A.045, 98-03-003, § 51-11-1130, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1130, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1131 Additions to existing buildings.** Additions to existing buildings or structures may be constructed without making the entire building or structure comply, provided that the new additions shall conform to the provisions of this Code.

**EXCEPTION:** New additions which do not fully comply with the requirements of this Code and which have a floor area which is less than seven hundred fifty square feet may be approved provided that improvements are made to the existing building to compensate for any deficiencies in the new addition. Compliance shall be demonstrated by either systems analysis per Section 1141.4 or component performance calculations per Sections 1330 through 1334. The nonconforming addition and upgraded, existing building shall have an energy budget or target UA and SHGC that are less than or equal to the unimproved existing building, with the addition designed to comply with this Code.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1131, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1132 Alterations and repairs.** Alterations and repairs to buildings or portions thereof originally constructed subject to the requirements of this Code shall conform to the provisions of this Code without the use of the exception in Section 1130. Other alterations and repairs may be made to existing buildings and moved buildings without

making the entire building comply with all of the requirements of this Code for new buildings, provided the following requirements are met:

1132.1 Building Envelope: Alterations or repairs shall comply with nominal R-values and glazing requirements in Table 13-1 or 13-2.

EXCEPTIONS:

1. Storm windows installed over existing glazing.
2. Glass replaced in existing sash and frame provided that glazing is of equal or lower U-factor.
3. For solar heat gain coefficient compliance, glazing with a solar heat gain coefficient equal to or lower than that of the other existing glazing.
4. Existing roof/ceiling, wall or floor cavities exposed during construction provided that these cavities are insulated to full depth with insulation having a minimum nominal value of R-3.0 per inch installed per Sections 1311 and 1313.
5. Existing walls and floors without framing cavities, provided that any new cavities added to existing walls and floors comply with Exception 4.
6. Existing roofs where the roof membrane is being replaced and
  - a. The roof sheathing or roof insulation is not exposed; or
  - b. If there is existing roof insulation below the deck.

In no case shall the energy efficiency of the building be decreased.

1132.2 Building Mechanical Systems: Those parts of systems which are altered or replaced shall comply with Chapter 14 of this Code.

All new systems in existing buildings, including packaged unitary equipment and packaged split systems, shall comply with Chapter 14.

Where mechanical cooling is added to a space that was not previously cooled, the mechanical cooling system shall comply with Sections 1413 and either 1423 or 1433.

EXCEPTIONS:

These exceptions only apply to situations where mechanical cooling is added to a space that was not previously cooled.

1. Water-cooled refrigeration equipment provided with a water economizer meeting the requirements of Section 1413 need not comply with 1423 or 1433. This exception shall not be used for RS-29 analysis.
2. Alternate designs that are not in full compliance with this Code may be approved when the building official determines that existing building or occupancy constraints make full compliance impractical or where full compliance would be economically impractical.

Alterations to existing mechanical cooling systems shall not decrease economizer capacity unless the system complies with Sections 1413 and either 1423 or 1433. In addition, for existing mechanical cooling systems that do not comply with Sections 1413 and either 1423 or 1433, including both the individual unit size limits and the total building capacity limits on units without economizer, other alterations shall comply with Table 11-1.

Existing equipment currently in use may be relocated within the same floor or same tenant space if removed and reinstalled within the same permit.

TABLE 11-1: ECONOMIZER COMPLIANCE OPTIONS FOR MECHANICAL ALTERATIONS

	Option A	Option B (alternate to A)	Option C (alternate to A)	Option D (alternate to A)
Unit Type	Any alteration with new or replacement equipment	Replacement unit of the same type with the same or smaller output capacity	Replacement unit of the same type with a larger output capacity	New equipment added to existing system or replacement unit of a different type
1. Packaged Units	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2</sup>	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2,3</sup>	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2,3</sup>	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2,4</sup>
2. Split Systems	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2</sup>	Efficiency: + 10/5% <sup>5</sup> Economizer: shall not decrease existing economizer capability	Only for new units < 54,000 Btu/h replacing unit installed prior to 1991 (one of two): Efficiency: + 10/5% <sup>5</sup> Economizer: 50% <sup>6</sup> For units > 54,000 Btu/h or any units installed after 1991: Option A	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2,4</sup>
3. Water Source Heat Pump	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2</sup>	(two of three): Efficiency: + 10/5% <sup>5</sup> Flow control valve <sup>7</sup> Economizer: 50% <sup>6</sup>	(three of three): Efficiency: + 10/5% <sup>5</sup> Flow control valve <sup>7</sup> Economizer: 50% <sup>6</sup> (except for certain pre-1991 systems <sup>8</sup> )	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2,4</sup> (except for certain pre-1991 systems <sup>8</sup> )
4. Hydronic Economizer using Air-Cooled Heat Rejection Equipment (Dry Cooler)	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2</sup>	Efficiency: + 10/5% <sup>5</sup> Economizer: shall not decrease existing economizer capacity	Option A	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2,4</sup>

TABLE 11-1: ECONOMIZER COMPLIANCE OPTIONS FOR MECHANICAL ALTERATIONS

	<b>Option A</b>	<b>Option B (alternate to A)</b>	<b>Option C (alternate to A)</b>	<b>Option D (alternate to A)</b>
<b>Unit Type</b>	<b>Any alteration with new or replacement equipment</b>	<b>Replacement unit of the same type with the same or smaller output capacity</b>	<b>Replacement unit of the same type with a larger output capacity</b>	<b>New equipment added to existing system or replacement unit of a different type</b>
5. Air-Handling Unit (including fan coil units) where the system has an air-cooled chiller	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2</sup>	Economizer: shall not decrease existing economizer capacity	Option A (except for certain pre-1991 systems <sup>8</sup> )	Option A (except for certain pre-1991 systems <sup>8</sup> )
6. Air-Handling Unit (including fan coil units) and Water-cooled Process Equipment, where the system has a water-cooled chiller <sup>10</sup>	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2</sup>	Economizer: shall not decrease existing economizer capacity	Option A (except for certain pre-1991 systems <sup>8</sup> and certain 1991-2004 systems <sup>9</sup> )	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2,4</sup> (except for certain pre-1991 systems <sup>8</sup> and certain 1991-2004 systems <sup>9</sup> )
7. Cooling Tower	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2</sup>	No requirements	Option A	Option A
8. Air-Cooled Chiller	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2</sup>	Efficiency: + 5% <sup>11</sup> Economizer: shall not decrease existing economizer capacity	Efficiency (two of two): (1) + 10% <sup>12</sup> and (2) multistage Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2,4</sup>
9. Water-Cooled Chiller	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2</sup>	Efficiency (one of two): (1) + 10% <sup>13</sup> or (2) plate frame heat exchanger <sup>15</sup> Economizer: shall not decrease existing economizer capacity	Efficiency (two of two): (1) + 15% <sup>14</sup> and (2) plate frame heat exchanger <sup>15</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2,4</sup>
10. Boiler	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2</sup>	Efficiency: + 8% <sup>16</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: + 8% <sup>16</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>1</sup> Economizer: 1433 <sup>2,4</sup>

1. Minimum equipment efficiency shall comply with Section 1411.1 and Tables 14-1A through M.
2. System and building shall comply with Section 1433 (including both the individual unit size limits and the total building capacity limits on units without economizer). It is acceptable to comply using one of the exceptions to Section 1433.
3. All equipment replaced in an existing building shall have air economizer complying with Sections 1413 and 1433 unless both the individual unit size and the total capacity of units without air economizer in the building is less than that allowed in Exception 1 to Section 1433.
4. All separate new equipment added to an existing building shall have air economizer complying with Sections 1413 and 1433 unless both the individual unit size and the total capacity of units without air economizer in the building is less than that allowed in Exception 1 to Section 1433.
5. Equipment shall have a capacity-weighted average cooling system efficiency:
  - a. For units with a cooling capacity below 54,000 Btu/h, a minimum of 10% greater than the requirements in Tables 14-1A and 14-1B (1.10 x values in Tables 14-1A and 14-1B).
  - b. For units with a cooling capacity of 54,000 Btu/h and greater, a minimum of 5% greater than the requirements in Tables 14-1A and 14-1B (1.05 x values in Tables 14-1A and 14-1B).
6. Minimum of 50% air economizer that is ducted in a fully enclosed path directly to every heat pump unit in each zone, except that ducts may terminate within 12 inches of the intake to an HVAC unit provided that they are physically fastened so that the outside air duct is directed into the unit intake. If this is an increase in the amount of outside air supplied to this unit, the outside air supply system shall be capable of providing this additional outside air and equipped with economizer control.



7. Have flow control valve to eliminate flow through the heat pumps that are not in operation with variable speed pumping control complying with Section 1432.2.2 for that heat pump.
  - When total capacity of units with flow control valves exceeds 15% of total system capacity, a variable frequency drive shall be installed on the main loop pump.
  - As an alternate to this requirement, have a capacity-weighted average cooling system efficiency that is 5% greater than the requirements in note 5 (i.e., a minimum of 15%/10% greater than the requirements in Tables 14-1A and 14-1B (1.15/1.10 x values in Tables 14-1A and 14-1B).)
8. Systems installed prior to 1991 without fully utilized capacity are allowed to comply with Option B, provided that the individual unit cooling capacity does not exceed 90,000 Btu/h.
9. Economizer not required for systems installed with water economizer plate and frame heat exchanger complying with previous codes between 1991 and June 2004, provided that the total fan coil load does not exceed the existing or added capacity of the heat exchangers.
10. For water-cooled process equipment where the manufacturer's specifications require colder temperatures than available with waterside economizer, that portion of the load is exempt from the economizer requirements.
11. The air-cooled chiller shall have an IPLV efficiency that is a minimum of 5% greater than the IPLV requirements in Table 14-1C (1.05 x IPLV values in Table 14-1C).
12. The air-cooled chiller shall:
  - a. Have an IPLV efficiency that is a minimum of 10% greater than the IPLV requirements in Table 14-1C (1.10 x IPLV values in Table 14-1C), and
  - b. Be multistage with a minimum of two compressors.
13. The water-cooled chiller shall have an NPLV efficiency that is a minimum of 10% greater than the NPLV requirements in Table 14-1K, Table 14-1L, or Table 14-1M (1.10 x NPLV values in Table 14-1K, Table 14-1L, or Table 14-1M).
14. The water-cooled chiller shall have an NPLV efficiency that is a minimum of 15% greater than the NPLV requirements in Table 14-1K, Table 14-1L, or Table 14-1M (1.15 x NPLV values in Table 14-1K, Table 14-1L, or Table 14-1M).
15. Economizer cooling shall be provided by adding a plate-frame heat exchanger on the waterside with a capacity that is a minimum of 20% of the chiller capacity at standard ARI rating conditions.
16. The replacement boiler shall have an efficiency that is a minimum of 8% higher than the value in Table 14-1F (1.08 x value in Table 14-1F), except for electric boilers.

1132.3 Lighting and Motors: Where the use in a space changes from one use in Table 15-1 to another use in Table 15-1, the installed lighting wattage shall comply with Section 1521 or 1531.

Other tenant improvements, alterations or repairs where 60 percent or more of the fixtures in a space enclosed by walls or ceiling-height partitions are new shall comply with Sections 1531 and 1532. (Where this threshold is triggered, the areas of the affected spaces may be combined for lighting code compliance calculations.) Where less than 60 percent of the fixtures in a space enclosed by walls or ceiling-height partitions are new, the installed lighting wattage shall be maintained or reduced. Where 60 percent or more of the lighting fixtures in a suspended ceiling are new, and the existing insulation is on the suspended ceiling, the roof/ceiling assembly shall be insulated according to the provisions of Chapter 13 Section 1311.2.

Where new wiring is being installed to serve added fixtures and/or fixtures are being relocated to a new circuit, controls shall comply with Sections 1513.1 through 1513.5 and, as applicable, 1513.7. In addition, office areas less than 300 ft<sup>2</sup> enclosed by walls or ceiling-height partitions, and all meeting and conference rooms, and all school classrooms, shall be equipped with occupancy sensors that comply with Sections 1513.6 and 1513.7. Where a new lighting panel (or a moved lighting panel) with all new raceway and conductor wiring from the panel to the fixtures is being installed, controls shall also comply with the other requirements in Sections 1513.6 and 1513.7.

Where new walls or ceiling-height partitions are added to an existing space and create a new enclosed space, but the

lighting fixtures are not being changed, other than being relocated, the new enclosed space shall have controls that comply with Sections 1513.1 through 1513.2, 1513.4, and 1513.6 through 1513.7.

Those motors which are altered or replaced shall comply with Section 1511.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1132, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1132, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1132, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1132, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1132, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1133 Change of occupancy or use.** Changes of occupancy or use shall comply with the following requirements:

a. Any unconditioned space that is altered to become semi-heated, cooled, or fully heated, or any semi-heated space that is altered to become cooled or fully heated space shall be required to be brought into full compliance with this Code.

b. Any Group R Occupancy which is converted to other than a Group R Occupancy shall be required to comply with all of the provisions of Sections 1130 through 1132 of this Code.

[Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-1133, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1133, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1134 Historic buildings.** The building official may modify the specific requirements of this Code

for historic buildings and require in lieu thereof alternate requirements which will result in a reasonable degree of energy efficiency. This modification may be allowed for those buildings which have been specifically designated as historically significant by the state or local governing body, or listed in The National Register of Historic Places or which have been determined to be eligible for listing.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1134, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1140 Enforcement.** The building official shall have the power to render interpretations of this code and to adopt and enforce rules and supplemental regulations in order to clarify the application of its provisions. Such interpretations, rules and regulations shall be in conformance with the intent and purpose of this Code. Fees may be assessed for enforcement of this Code and shall be as set forth in the fee schedule adopted by the jurisdictions.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1140, filed 10/18/93, effective 4/1/94.]

#### **WAC 51-11-1141 Plans and specifications.**

1141.1 General: If required by the building official, plans and specifications shall be submitted in support of an application for a building permit. If required by the building official, plans and specifications shall be stamped and authenticated by a registered design professional currently licensed in the state of Washington. All plans and specifications, together with supporting data, shall be submitted to the building official prior to issuance of a building permit.

1141.2 Details: The plans and specifications shall show in sufficient detail all pertinent data and features of the building and the equipment and systems as herein governed including, but not limited to: Design criteria; exterior envelope component materials, U-factors of the envelope systems, R-values of insulating materials; U-factors and shading coefficients of glazing; area weighted U-factor calculations; efficiency, economizer, size and type of apparatus and equipment; fan system horsepower; equipment and systems controls; lighting fixture schedule with wattages and controls narrative; and other pertinent data to indicate compliance with the requirements of this Code.

1141.3 Alternate Materials and Method of Construction: The provisions of this Code are not intended to prevent the use of any material, method of construction, design or insulating system not specifically prescribed herein, provided that such construction, design or insulating system has been approved by the building official as meeting the intent of this Code. The building official may approve any such alternate provided the proposed alternate meets or exceeds the provisions of this Code and that the material, method, design or work offered is for the purpose intended, at least the equivalent of that prescribed in this Code, in quality, strength, effectiveness, fire-resistance, durability, safety, and energy efficiency. The building official may require that sufficient evidence of proof be submitted to substantiate any claims that may be made regarding performance capabilities.

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1141.4 Systems Analysis Approach for the Entire Building: In lieu of using Chapters 12 through 20, compliance may be demonstrated using the systems analysis option in RS-29. When using systems analysis, the proposed building shall provide equal or better conservation of energy than the standard design as defined in RS-29. If required by the building official, all energy comparison calculations submitted under the provisions of RS-29 shall be stamped and authenticated by an engineer or architect licensed to practice by the state of Washington.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1141, filed 10/18/93, effective 4/1/94.]

#### **WAC 51-11-1142 Materials and equipment.**

1142.1 Identification: All materials and equipment shall be identified in order to show compliance with this Code.

1142.2 Maintenance Information: Maintenance instructions shall be furnished for any equipment which requires preventive maintenance for efficient operation. Required regular maintenance actions shall be clearly stated and incorporated on a readily accessible label. Such label may be limited to identifying, by title or publication number, the operation and maintenance manual for that particular model and type of product.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1142, filed 10/18/93, effective 4/1/94.]

#### **WAC 51-11-1143 Inspections.**

1143.1 General: All construction or work for which a permit is required shall be subject to inspection by the building official and all such construction or work shall remain accessible and exposed for inspection purposes until approved by the building official. No work shall be done on any part of the building or structure beyond the point indicated in each inspection without first obtaining the approval of the building official.

1143.2 Required Inspections: The building official, upon notification, shall make the inspection required in this Section, in addition to or as part of those inspections required in Section 109.3 of the International Building Code. Inspections may be conducted by special inspection pursuant to Section 1704 of the International Building Code. Where applicable, inspections shall include at least:

##### **1143.2.1 Envelope**

a. Wall Insulation Inspection: To be made after all wall insulation and air vapor retarder sheet or film materials are in place, but before any wall covering is placed.

b. Glazing Inspection: To be made after glazing materials are installed in the building.

c. Exterior Roofing Insulation: To be made after the installation of the roof insulation, but before concealment.

d. Slab/Floor Insulation: To be made after the installation of the slab/floor insulation, but before concealment.

##### **1143.2.2 Mechanical**

a. Mechanical Equipment Efficiency and Economizer: To be made after all equipment and controls required by this

Code are installed and prior to the concealment of such equipment or controls.

b. Mechanical Pipe and Duct Insulation: To be made after all pipe and duct insulation is in place, but before concealment.

#### 1143.2.3 Lighting and Motors

a. Lighting Equipment and Controls: To be made after the installation of all lighting equipment and controls required by this Code, but before concealment of the lighting equipment.

b. Motor Inspections: To be made after installation of all equipment covered by this Code, but before concealment.

1143.3 Reinspection: The building official may require a structure to be reinspected. A reinspection fee may be assessed for each inspection or reinspection when such portion of work for which inspection is called is not complete or when corrections called for are not made.

[Statutory Authority: RCW 19.27A.020, 19.27A.045, 04-01-106, § 51-11-1143, filed 12/17/03, effective 7/1/04. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226, 95-01-126, § 51-11-1143, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1143, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1144 Violations.** It shall be a violation of this Code for any person, firm, or corporation to erect or construct any building, or remodel or rehabilitate any existing building or structure in the state, or allow the same to be done, contrary to any of the provisions of this Code.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1144, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1150 Conflicts with other codes.** In case of conflicts among Codes enumerated in RCW 19.27.031 (1), (2), (3) and (4) and this Code, the first named Code shall govern. The duct insulation requirements in this Code or a local jurisdiction's energy code, whichever is more stringent, supersede the requirements in the Mechanical Code.

Where, in any specific case, different sections of this Code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.

[Statutory Authority: RCW 19.27A.020, 19.27A.045, 04-01-106, § 51-11-1150, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1150, filed 10/18/93, effective 4/1/94.]

#### **WAC 51-11-1160 Severability and liability.**

1161 Severability: If any provision of this Code or its application to any person or circumstance is held invalid, the remainder of this Code or the application of the provision to other persons or circumstances is not affected.

1162 Liability: Nothing contained in this Code is intended to be nor shall be construed to create or form the basis for any liability on the part of any city or county or its officers, employees or agents for any injury or damage resulting from the failure of a building to conform to the provisions of this Code.

[Title 51 WAC—p. 80]

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1160, filed 10/18/93, effective 4/1/94.]

## **CHAPTER 12 DEFINITIONS**

**Note: For nonresidential definitions, see Chapter 2.**

## **CHAPTER 13 BUILDING ENVELOPE**

**WAC 51-11-1301 Scope.** Conditioned buildings or portions thereof shall be constructed to provide the required thermal performance of the various components according to the requirements of this chapter. Unless otherwise approved by the building official, all spaces shall be assumed to be at least semi-heated.

#### **EXCEPTION**

1. Greenhouses isolated from any conditioned space and not intended for occupancy.
2. As approved by the building official, spaces not assumed to be at least semi-heated.
3. Unconditioned Group U Occupancy accessory to Group R Occupancy.
4. Unstaffed equipment shelters or cabinets used solely for personal wireless service facilities.

[Statutory Authority: RCW 19.27.074, 19.27A.020 and 19.27A.025, 97-03-017, § 51-11-1301, filed 1/7/97, effective 7/1/97. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1301, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1302 Space heat type.** For the purpose of determining building envelope requirements, the following two categories comprise all space heating types:

**Electric Resistance:** Space heating systems which use electric resistance elements as the primary heating systems including baseboard, radiant, and forced air units where the total electric resistance heat capacity exceeds one watt per square foot of the gross conditioned floor area.

**EXCEPTION:** Heat pumps and terminal electric resistance heating in variable air volume distribution systems.

**Other:** All other space heating systems including gas, solid fuel, oil, and propane space heating systems and those systems listed in the exception to electric resistance.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1302, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1303 Climate zones.** All buildings shall comply with the requirements of the appropriate climate zone as defined herein.

- ZONE 1:** Climate Zone 1 shall include all counties not included in Climate Zone 2.
- ZONE 2:** Climate Zone 2 shall include: Adams, Chelan, Douglas, Ferry, Grant, Kittitas, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, and Whitman counties.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1303, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1310 General requirements.** The building envelope shall comply with Sections 1311 through 1314.

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1310.1 Conditioned Spaces: The building envelope for conditioned spaces shall also comply with one of the following paths:

- a. Prescriptive Building Envelope Option Sections 1320 through 1323.
- b. Component Performance Building Envelope Option Sections 1330 through 1334.
- c. Systems Analysis. See Section 1141.4.

1310.2 Semi-Heated Spaces: All spaces shall be considered conditioned spaces, and shall comply with the requirements in Section 1310.1 unless they meet the following criteria for semi-heated spaces. The installed heating equipment output, in Climate Zone 1, shall be 3 Btu/(h • ft<sup>2</sup>) or greater but not greater than 8 Btu/(h • ft<sup>2</sup>) and in Climate Zone 2, shall be 5 Btu/(h • ft<sup>2</sup>) or greater but not greater than 12 Btu/(h • ft<sup>2</sup>).

For semi-heated spaces, the building envelope shall comply with the same requirements as that for conditioned spaces in Section 1310.1.

EXCEPTION: For semi-heated spaces heated by other fuels only, wall insulation is not required for those walls that separate semi-heated spaces (see definition in Section 201.1) from the exterior provided that the space is heated solely by a heating system controlled by a thermostat with a maximum setpoint capacity of 45°F, mounted no lower than the heating unit.

**Figure 13A**  
**Building Envelope Compliance Options**

Section Number	Subject	Prescriptive Option	Component Performance Option	Systems Analysis Option
1310	General Requirements	X	X	X
1311	Insulation	X	X	X
1312	Glazing and Doors	X	X	X
1313	Moisture Control	X	X	X
1314	Air Leakage	X	X	X
1320	Prescriptive Building Envelope Option	X		
1321	General	X		
1322	Opaque Envelope	X		
1323	Glazing	X		
1330	Component Performance Building Envelope Option		X	
1331	General		X	
1332	Component U-Factors		X	
1333	UA Calculations		X	
1334	Solar Heat Gain Coefficient		X	
RS-29	Systems Analysis			X

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1310, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1310, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1311 Insulation.

1311.1 Installation Requirements: All insulation materials shall be installed according to the manufacturer's instructions to achieve proper densities, maintain clearances, and maintain uniform R-values. To the maximum extent possible, insulation shall extend over the full component area to the intended R-value.

1311.2 Roof/Ceiling Insulation: Open-blown or poured loose-fill insulation may be used in attic spaces where the

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slope of the ceiling is not more than three feet in twelve and there is at least thirty inches of clear distance from the top of the bottom chord of the truss or ceiling joist to the underside of the sheathing at the roof ridge. When eave vents are installed, baffling of the vent openings shall be provided so as to deflect the incoming air above the surface of the insulation.

Where lighting fixtures are recessed into a suspended or exposed grid ceiling, the roof/ceiling assembly shall be insulated in a location other than directly on the suspended ceiling.

EXCEPTION: Type IC rated recessed lighting fixtures.

Where installed in wood framing, faced batt insulation shall be face stapled.

1311.3 Wall Insulation: Exterior wall cavities isolated during framing shall be fully insulated to the levels of the surrounding walls. When installed in wood framing, faced batt insulation shall be face stapled.

Above grade exterior insulation shall be protected.

1311.4 Floor Insulation: Floor insulation shall be installed in a permanent manner in substantial contact with the surface being insulated. Insulation supports shall be installed so spacing is not more than twenty-four inches on center. Installed insulation shall not block the airflow through foundation vents.

1311.5 Slab-On-Grade Floor: Slab-on-grade insulation installed inside the foundation wall shall extend downward from the top of the slab a minimum distance of twenty-four inches or to the top of the footing, whichever is less. Insulation installed outside the foundation shall extend downward a minimum of twenty-four inches or to the frostline, whichever is greater. Above grade insulation shall be protected.

EXCEPTION: For monolithic slabs, the insulation shall extend downward from the top of the slab to the bottom of the footing.

1311.6 Radiant Floors (on or below grade): Slab-on-grade insulation shall extend downward from the top of the slab a minimum distance of thirty-six inches or downward to the top of the footing and horizontal for an aggregate of not less than thirty-six inches.

If required by the building official where soil conditions warrant such insulation, the entire area of a radiant floor shall be thermally isolated from the soil. Where a soil gas control system is provided below the radiant floor, which results in increased convective flow below the radiant floor, the radiant floor shall be thermally isolated from the sub-floor gravel layer.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1311, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1312 Glazing and doors.

1312.1 Standard Procedure for Determination of Glazing and Door U-Factors: U-Factors for glazing and doors shall be determined, certified and labeled in accordance with Standard RS-31 by a certified independent agency licensed by the National Fenestration Rating Council (NFRC). Compliance shall be based on the Residential or the Nonresidential Model

Size. Product samples used for U-factor determinations shall be production line units or representative of units as purchased by the consumer or contractor. Unlabeled glazing and doors shall be assigned the default U-factor in Table 10-6.

1312.2 Solar Heat Gain Coefficient and Shading Coefficient: Solar Heat Gain Coefficient (SHGC), shall be determined, certified and labelled in accordance with the National Fenestration Rating Council (NFRC) Standard by a certified, independent agency, licensed by the NFRC.

EXCEPTION: Shading coefficients (SC) shall be an acceptable alternate for compliance with solar heat gain coefficient requirements. Shading coefficients for glazing shall be taken from Chapter 31 of RS-1 or from the manufacturer's test data.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1312, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1312, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1312, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1312, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1313 Moisture control.

1313.1 Vapor Retarders: Vapor retarders shall be installed on the warm side (in winter) of insulation as required by this section.

EXCEPTION: Vapor retarder installed with not more than 1/3 of the nominal R-value between it and the conditioned space.

1313.2 Roof/Ceiling Assemblies: Roof/ceiling assemblies where the ventilation space above the insulation is less than an average of twelve inches shall be provided with a vapor retarder. (For enclosed attics and enclosed rafter spaces see Section 1203.2 of the International Building Code.) Roof/ceiling assemblies without a vented airspace, allowed only where neither the roof deck nor the roof structure are made of wood, shall provide a continuous vapor retarder with taped seams.

EXCEPTION: Vapor retarders need not be provided where all of the insulation is installed between the roof membrane and the structural roof deck.

1313.3 Walls: Walls separating conditioned space from unconditioned space shall be provided with a vapor retarder.

1313.4 Floors: Floors separating conditioned space from unconditioned space shall be provided with a vapor retarder.

1313.5 Crawl Spaces: A ground cover of six mil (0.006 inch thick) black polyethylene or approved equal shall be laid over the ground within crawl spaces. The ground cover shall be overlapped twelve inches minimum at the joints and shall extend to the foundation wall.

EXCEPTION: The ground cover may be omitted in crawl spaces if the crawl space has a concrete slab floor with a minimum thickness of three and one-half inches.

[Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1313, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1313, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1313, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1314 Air leakage.

1314.1 Building Envelope: The requirements of this section shall apply to building elements separating conditioned from unconditioned spaces. Exterior joints around windows and door frames, openings between walls and foundation, between walls and roof and wall panels; openings at penetrations of utility services through walls, floors, and roofs; and all other openings in the building envelope shall be sealed, caulked, gasketed, or weatherstripped to limit air leakage.

1314.2 Glazing and Doors: Doors and operable glazing separating conditioned from unconditioned space shall be weatherstripped. Fixed windows shall be tight fitting with glass retained by stops with sealant or caulking all around.

EXCEPTION: Openings that are required to be fire resistant.

1314.3 Building Assemblies Used as Ducts or Plenums: Building assemblies used as ducts or plenums shall be sealed, caulked, and gasketed to limit air leakage.

1314.4 Recessed Lighting Fixtures: When installed in the building envelope, recessed lighting fixtures shall be Type IC rated, and certified under ASTM E283 to have no more than 2.0 cfm air movement from the conditioned space to the ceiling cavity. The lighting fixture shall be tested at 75 Pascals or 1.57 lbs/ft<sup>2</sup> pressure difference and have a label attached, showing compliance with this test method. Recessed lighting fixtures shall be installed with a gasket or caulk between the fixture and ceiling to prevent air leakage.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1314, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1314, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1320 Prescriptive building envelope option.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1320, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1321 General.** This section establishes building envelope design criteria in terms of prescribed requirements for building construction.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1321, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1322 Opaque envelope.** Roof/ceilings, opaque exterior walls, opaque doors, floors over unconditioned space, below grade walls, slab on grade floors, and radiant floors enclosing conditioned spaces shall be insulated according to Section 1311 and Tables 13-1 or 13-2. Compliance with nominal R-values shall be demonstrated for the thermal resistance of the added insulation in framing cavities and/or insulated sheathing only. Nominal R-values shall not include the thermal transmittance of other building materials or air films.

For metal frame assemblies used in spaces with electric resistance space heat, compliance shall be demonstrated with the component U-factor for the overall assembly based on the assemblies in Chapter 10.

EXCEPTIONS:

1. Opaque smoke vents are not required to meet insulation requirements.
2. For prescriptive compliance only.

a. For glazing areas that are 30% and less of the gross wall area, the insulation of the perimeter edge of an above grade floor slab which penetrates the exterior wall may be reduced to R-5 provided the glazing U-factor is reduced by U-0.05 below that required in Tables 13-1 and 13-2.

b. For glazing areas that exceed 30% of the gross wall area, the perimeter edge of an above grade floor slab which penetrates the exterior wall may be left uninsulated provided that the glazing U-factor is reduced by U-0.10 below that required in Tables 13-1 and 13-2.

[Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1322, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1322, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1322, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1323 Glazing.** Glazing shall comply with Section 1312 and Tables 13-1 or 13-2. All glazing shall be, at a minimum, double glazing.

**EXCEPTIONS:**

1. Vertical glazing located on the display side of the street level story of a retail occupancy provided the glazing

a. Is double-glazed with a minimum 1/2 inch airspace and with a low-e coating having a maximum emittance of e-0.40 or has an area weighted U-factor of 0.60 or less. (When this exception is used, there are no SHGC requirements) and,

b. Does not exceed 75 percent of the gross exterior wall area of the display side of the street level story. However, if the display side of the street level story exceeds 20 feet in height, then this exception may only be used for the first 20 feet of that story.

When this exception is utilized, separate calculations shall be performed for these sections of the building envelope and these values shall not be averaged with any others for compliance purposes. The 75 percent area may be exceeded on the street level, if the additional glass area is provided from allowances from other areas of the building.

2. Single glazing for ornamental, security, or architectural purposes shall be included in the percentage of the total glazing area, U-factor calculation and SHGC as allowed in the Tables 13-1 or 13-2. The maximum area allowed for the total of all single glazing is one percent of the gross exterior wall floor area.

**1323.1 Area:** The percentage of total glazing (vertical and overhead) area relative to the gross exterior wall area shall not be greater than the appropriate value from Tables 13-1 or 13-2 for the vertical glazing U-factor, overhead glazing U-factor and solar heat gain coefficient selected.

**1323.2 U-Factor:** The area-weighted average U-factor of vertical glazing shall not be greater than that specified in Tables 13-1 or 13-2 for the appropriate area and solar heat gain coefficient. The area-weighted average U-factor of overhead glazing shall not be greater than that specified in Tables 13-1 or 13-2 for the appropriate area and solar heat gain coefficient. U-factors for glazing shall be determined in accordance with Section 1312.

**1323.3 Solar Heat Gain Coefficient:** The area-weighted average solar heat gain coefficient of all glazing shall not be greater than that specified in Tables 13-1 or 13-2 for the appropriate area and U-factor.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1323, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1323, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1323, filed 10/18/93, effective 4/1/94.]

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**WAC 51-11-1330 Component performance building envelope option.**

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1330, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1331 General.** Buildings or structures whose design heat loss rate ( $UA_p$ ) and solar heat gain coefficient rate ( $SHGC \cdot A_p$ ) are less than or equal to the target heat loss rate ( $UA_t$ ) and solar heat gain coefficient rate ( $SHGC \cdot A_t$ ) shall be considered in compliance with this section. The stated U-factor, F-factor or allowable area of any component assembly, listed in Tables 13-1 or 13-2, such as roof/ceiling, opaque wall, opaque door, glazing, floor over conditioned space, slab on grade floor, radiant floor or opaque floor may be increased and the U-factor or F-factor for other components decreased, provided that the total heat gain or loss for the entire building envelope does not exceed the total resulting from compliance to the U-factors, F-factors or allowable areas specified in this section.

**EXCEPTION:** Compliance is also allowed to be shown using RS-32 for Climate Zone 1.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1331, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1331, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1331, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1331, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1331, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1332 Component U-factors.** The U-factors for typical construction assemblies are included in Chapter 10. These values shall be used for all calculations. Where proposed construction assemblies are not represented in Chapter 10, values shall be calculated in accordance with Chapters 23 through 30 in Standard RS-1 listed in Chapter 7, using the framing factors listed in Chapter 10. For envelope assemblies containing metal framing, the U-factor shall be determined by one of the following methods:

1. Results of laboratory measurements according to acceptable methods of test.
2. Standard RS-1, listed in Chapter 7, where the metal framing is bonded on one or both sides to a metal skin or covering.
3. The zone method as provided in Chapter 25 of Standard RS-1, listed in Chapter 7.
4. Effective framing/cavity R-values as provided in Table 10-5A.

When return air ceiling plenums are employed, the roof/ceiling assembly shall:

- a. For thermal transmittance purposes, not include the ceiling proper nor the plenum space as part of the assembly; and
- b. For gross area purposes, be based upon the interior face of the upper plenum surface.

[Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1332, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1332, filed 10/18/93, effective 4/1/94.]

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**WAC 51-11-1333 UA calculations.** The target  $UA_t$  and the proposed  $UA_p$  shall be calculated using Equations 13-1 and 13-2 and the corresponding areas and U-factors from Table 13-1 or 13-2. For the target  $UA_t$  calculation, the overhead glazing shall be located in roof/ceiling area and the remainder of the glazing allowed per Table 13-1 or 13-2 shall be located in the wall area.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1333, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1334 Solar heat gain coefficient rate calculations.** Solar heat gain coefficient shall comply with Section 1323.3. The target  $SHGCA_t$  and the proposed  $SHGCA_p$  shall be calculated using Equation 13-3 and 13-4 and the corresponding areas and SHGCs from Table 13-1 or 13-2.

**Equation 13-1:  
Target  $UA_{t[1]}$**

$$UA_t = U_{rat}A_{rat} + U_{ograt}A_{ograt} + U_{ort}A_{ort} + U_{ogort}A_{ogort} + U_{wt}A_{wt} + U_{vgt}A_{vgt} + U_{dt}A_{dt} + U_{ft}A_{ft} + F_{st}P_{st} + U_{bgwt}A_{bgwt}$$

$UA_t$  = The target combined specific heat transfer of the gross roof/ceiling assembly, exterior wall and floor area.

Where:

$U_{rat}$  = The thermal transmittance value for roofs over attics found in Table 13-1 or 13-2.

$U_{ograt}$  = The thermal transmittance for overhead glazing found in Table 13-1 or 13-2 which corresponds to the proposed total glazing area as a percent of gross exterior wall area.

$U_{ort}$  = The thermal transmittance value for other roofs found in Table 13-1 or 13-2.

$U_{ogort}$  = The thermal transmittance for overhead glazing found in Table 13-1 or 13-2 which corresponds to the proposed total glazing area as a percent of gross exterior wall area.

$U_{wt}$  = The thermal transmittance value for opaque walls found in Table 13-1 or 13-2.

$U_{vgt}$  = The thermal transmittance value for vertical glazing found in Table 13-1 or 13-2 which corresponds to the proposed total glazing area as a percent of gross exterior wall area.

$U_{dt}$  = The thermal transmittance value for opaque doors found in Table 13-1 or 13-2.

$U_{ft}$  = The thermal transmittance value for floors over unconditioned space found in Table 13-1 or 13-2.

$F_{st}$  = The F-factor for slab-on-grade and radiant slab floors found in Table 13-1 or 13-2.

$U_{bgwt}$  = The thermal transmittance value for opaque walls found in Table 13-1 or 13-2.

$A_{dt}$  = The proposed opaque door area,  $A_d$ .

$A_{ft}$  = The proposed floor over unconditioned space area,  $A_f$ .

$P_{st}$  = The proposed lineal feet of slab-on-grade and radiant slab floor perimeter,  $P_s$ .

$A_{bgwt}$  = The proposed below grade wall area,  $A_{bgw}$ .

**and;**

if the total amount of glazing area as a percent of gross exterior wall area does not exceed the maximum allowed in Table 13-1 or 13-2:

$A_{rat}$  = The proposed roof over attic area,  $A_{ra}$ .

$A_{ograt}$  = The proposed overhead glazing area in roofs over attics,  $A_{ogra}$ .

$A_{ort}$  = The proposed other roof area,  $A_{or}$ .

$A_{ogort}$  = The proposed overhead glazing area in other roofs,  $A_{ogor}$ .

$A_{wt}$  = The proposed opaque above grade wall area,  $A_w$ .

$A_{vgt}$  = The proposed vertical glazing area,  $A_{vg}$ .

**or;**

if the total amount of glazing area as a percent of gross exterior wall area exceeds the maximum allowed in Table 13-1 or 13-2:

$A_{rat}$  = The greater of:  
the proposed roof over attic area, and  
the gross roof over attic area minus  $A_{ograt}$ .

$A_{ograt}$  = The lesser of:  
proposed overhead glazing area in roofs over attics, and  
the maximum allowed glazing area from Table 13-1 or 13-2.

$A_{ort}$	=	The greater of: the proposed other roof area, and the gross other roof area minus $A_{ogort}$ .
$A_{ogort}$	=	The lesser of: the proposed overhead glazing area in other roofs, and the maximum allowed glazing area from Table 13-1 or 13-2 minus $A_{ograt}$ .
$A_{wt}$	=	The greater of: proposed opaque above grade wall area, and the gross exterior above grade wall area minus $A_{dt}$ minus $A_{vgt}$ .
$A_{vgt}$	=	The lesser of: the proposed vertical glazing area, and the maximum allowed glazing area from Table 13-1 or 13-2 minus $A_{ograt}$ minus $A_{ogort}$ .

**EQUATION 13-2**  
**Proposed  $UA_p$**

$$UA_p = U_{ra}A_{ra} + U_{or}A_{or} + U_{og}A_{og} + U_wA_w + U_dA_d + U_{vg}A_{vg} + U_fA_f + F_sP_s + U_{bgw}A_{bgw}$$

Where:

$UA_p$	=	The combined proposed specific heat transfer of the gross exterior wall, floor and roof/ceiling assembly area.
$U_{ra}$	=	The thermal transmittance of the roof over attic area.
$A_{ra}$	=	Opaque roof over attic area.
$U_{or}$	=	The thermal transmittance of the other roof area.
$A_{or}$	=	Opaque other roof area.
$U_{og}$	=	The thermal transmittance for the overhead glazing
$A_{og}$	=	Overhead glazing area.
$U_w$	=	The thermal transmittance of the opaque wall area.
$A_w$	=	Opaque above grade wall area (not including opaque doors).
$U_{vg}$	=	The thermal transmittance of the vertical glazing area.
$A_{vg}$	=	Vertical glazing area.
$U_d$	=	The thermal transmittance value of the opaque door area.
$A_d$	=	Opaque door area.
$U_f$	=	The thermal transmittance of the floor over unconditioned space area.
$A_f$	=	Floor area over unconditioned space.
$F_s$	=	Slab-on-grade or radiant floor component F-factor.
$P_s$	=	Lineal feet of slab-on-grade or radiant floor perimeter.
$U_{bgw}$	=	The thermal transmittance value of the below grade wall area.
$A_{bgw}$	=	Below grade wall area as defined in Tables 13-1 or 13-2.

**NOTE:** Where more than one type of wall, window, roof/ceiling, door and skylight is used, the U and A terms for those items shall be expanded into sub-elements as:

$$U_{w1}A_{w1} + U_{w2}A_{w2} + U_{w3}A_{w3} + \dots \text{etc.}$$

**EQUATION 13-3**  
**Target  $SHGCA_t$**

$$SHGCA_t = SHGC_t (A_{ograt} + A_{ogort} + A_{vgt})$$

Where:

$SHGCA_t$  = The target combined specific heat gain of the target glazing area.

$SHGC_t$  = The solar heat gain coefficient for glazing found in Table 13-1 or 13-2 which corresponds to the proposed total glazing area as a percent of gross exterior wall area, and

$A_{ograt}$ ,  $A_{ogort}$ , and  $A_{vgt}$  are defined under Equation 13-1.



**EQUATION 13-4**  
**Proposed SHGCA<sub>p</sub>**

$$\text{SHGCA}_p = \text{SHGC}_{og} A_{og} + \text{SHGC}_{vg} A_{vg}$$

Where:

- SHGCA<sub>t</sub> = The combined proposed specific heat gain of the proposed glazing area.
- SHGC<sub>og</sub> = The solar heat gain coefficient of the overhead glazing.
- A<sub>og</sub> = The overhead glazing area.
- SHGC<sub>vg</sub> = The solar heat gain coefficient of the vertical glazing.
- A<sub>vg</sub> = The vertical glazing area.

**TABLE 13-1**  
**BUILDING ENVELOPE REQUIREMENTS FOR CLIMATE ZONE 1**  
**MINIMUM INSULATION R-VALUES OR**  
**MAXIMUM COMPONENT U-FACTORS FOR ZONE 1**

**Building Components**

Space Heat Type	Components					
	Roofs Over Attic <sup>3</sup>	All Other Roofs <sup>3</sup>	Opaque Walls <sup>1,2</sup>	Opaque Doors	Floor Over Uncond Space	Slab On Grade <sup>5</sup>
1. Electric resistance heat**	R-38 or U = 0.031	R-30 or U = 0.034	R-19 or U = 0.062	U = 0.60	R-30 or U = 0.029	R-10 or F = 0.54
2. All others including Heat pumps and VAV	R-30 or U = 0.036	R-21 or U = 0.046	(a) Metal framing: R-19 or U = 0.109 (b) Wood framing and framing other than metal: R-19 or U = 0.062	U = 0.60	R-19 or U = 0.056	R-10 or F = 0.54

\*\* Compliance with nominal prescriptive R-values requires wood framing.

**MAXIMUM GLAZING AREAS AND U-FACTORS AND**  
**MAXIMUM GLAZING SOLAR HEAT GAIN COEFFICIENTS**  
**FOR ZONE 1**

**Glazing**

Maximum Glazing Area as % of Wall	0% to 30%			>30% to 45%		
	Maximum U-Factor		Max. SHGC <sup>4</sup>	Maximum U-Factor		Max. SHGC <sup>4</sup>
	VG	OG		VG	OG	
1. Electric resistance heat	0.40	0.60	0.40	PRESCRIPTIVE PATH NOT ALLOWED		
2. All others including heat pumps and VAV	0.55	0.70	0.45	0.45	0.60	0.40

**Footnotes**

**1. Below Grade Walls:**

When complying by the prescriptive approach, Section 1322:

- a) Walls insulated on the interior shall use opaque wall values,
- b) Walls insulated on the exterior shall use a minimum of R-10 insulation,
- c) Walls shall be insulated for the first 10 feet below grade. (There shall be no credit for those portions of below grade walls and footings that are more than 10 feet below grade, and those portions below 10 feet shall not be included in the gross exterior wall area).

When complying by the component performance approach, Section 1331:

- a) Walls insulated on the interior shall use the opaque wall values when determining U<sub>bgwt</sub>,
- b) Walls insulated on the exterior shall use a target U-factor of U = 0.070 for U<sub>bgwt</sub>,
- c) The calculations shall include the first 10 feet of walls below grade. (Those portions of below grade walls and footings that are more than 10 feet below grade shall not be included in the gross exterior wall area and shall not be included when determining A<sub>bgwt</sub> and A<sub>bgw</sub>).

2. **Concrete Masonry Walls:** If the area weighted heat capacity of the total opaque above grade wall is a minimum of  $9.0 \text{ Btu/ft}^2 \cdot ^\circ\text{F}$ , then:  
 a. The area weighted average U-factor may be increased to U-0.15 maximum, or minimum additional R-5.7 continuous insulation uninterrupted by framing; or  
 b. The wall may be ASTM C90 concrete block walls, ungrouted or partially grouted at 32 in. or less on center vertically and 48 in. or less on center horizontally, with ungrouted cores filled with material having a maximum thermal conductivity of  $0.44 \text{ Btu-in/h} \cdot \text{ft}^2 \cdot ^\circ\text{F}$ .  
 – Individual walls with heat capacities less than  $9.0 \text{ Btu/ft}^2 \cdot ^\circ\text{F}$  and below grade walls shall meet opaque wall requirements listed above.  
 – Glazing shall comply with the glazing requirements listed above.
3. **Roof Types:** A roof over attic is where the roof structure has at least 30 inches clear distance from the top of the bottom chord of a truss or ceiling joist to the underside of the sheathing at the roof ridge, and the ceiling is attached to the ceiling joist or the bottom of the truss or ceiling joist. Anything else is considered all other roofs.
4. **SHGC (Solar Heat Gain Coefficient per Section 1312.2):** May substitute Maximum Shading Coefficient (SC) for SHGC (See Chapter 2 for definition of Shading Coefficient).
5. **Radiant Floors:** Where insulation is required under the entire slab, radiant floors shall use a minimum of R-10 insulation or  $F = 0.55$  maximum. Where insulation is not required under the entire slab, radiant floors shall use R-10 perimeter insulation according to Section 1311.6 or  $F = 0.78$  maximum.

TABLE 13-2  
BUILDING ENVELOPE REQUIREMENTS  
FOR CLIMATE ZONE 2

MINIMUM INSULATION R-VALUES OR  
MAXIMUM COMPONENT U-FACTORS FOR ZONE 2

Building Components

Space Heat Type	Components					
	Roofs Over Attic <sup>3</sup>	All Other Roofs <sup>3</sup>	Opaque Walls <sup>1,2</sup>	Opaque Doors	Floor Over Uncond Space	Slab On Grade
1. Electric resistance heat**	R-38 or U = 0.031	R-30 or U = 0.034	R-24 or U = 0.044	U = 0.60	R-30 or U = 0.029	R-10 or F = 0.54
2. All others including Heat pumps and VAV	R-38 or U = 0.031	R-25 or U = 0.039	(a) Metal framing: R-13 cavity insul. +R-3.8 continuous insul. or U = 0.084 (b) Wood framing and framing other than metal: R-19 or U = 0.062	U = 0.60	R-21 or U = 0.047	R-10 or F = 0.54

\*\* Compliance with nominal prescriptive R-values requires wood framing.

MAXIMUM GLAZING AREAS AND U-FACTORS AND  
MAXIMUM GLAZING SOLAR HEAT GAIN COEFFICIENTS  
FOR ZONE 2

Glazing

Maximum Glazing Area as % of Wall	0% to 30%			>30% to 45%		
	Maximum U-Factor		Max. SHGC <sup>4</sup>	Maximum U-Factor		Max. SHGC <sup>4</sup>
	VG	OG		VG	OG	
1. Electric resistance heat	0.40	0.60	0.40	PRESCRIPTIVE PATH NOT ALLOWED		
2. All others including heat pumps and VAV	0.55	0.70	0.45	0.45	0.60	0.40

Footnotes

1. **Below Grade Walls:**

When complying by the prescriptive approach, Section 1322:

- Walls insulated on the interior shall use opaque wall values,
- Walls insulated on the exterior shall use a minimum of R-12 insulation,
- Walls shall be insulated for the first 10 feet below grade. (There shall be no credit for insulating those portions of below grade walls and footings that are more than 10 feet below grade, and

those portions below 10 feet shall not be included in the gross exterior wall area.)

When complying by the component performance approach, Section 1331:

- Walls insulated on the interior shall use the opaque wall values when determining  $U_{\text{bgwt}}$ ,
- Walls insulated on the exterior shall use a target U-factor of  $U = 0.061$  for  $U_{\text{bgwt}}$ .

- c) The calculations shall include the first 10 feet of walls below grade. (Those portions of below grade walls and footings that are more than 10 feet below grade shall not be included in the gross exterior wall area and shall not be included when determining  $A_{bgwt}$  and  $A_{bgw}$ .)
2. **Concrete Masonry Walls:** If the area weighted heat capacity of the total opaque above grade wall is a minimum of 9.0 Btu/ft<sup>2</sup> • °F, then the U-factor may be increased to 0.123 maximum, or minimum additional R-7.6 continuous insulation uninterrupted by framing.
- Individual walls with heat capacities less than 9.0 Btu/ft<sup>2</sup> • °F and below grade walls shall meet opaque wall requirements listed above.
  - Glazing shall comply with the glazing requirements above.
3. **Roof Types:** A roof over attic is where the roof structure has at least 30 inches clear distance from the top of the bottom chord of a truss or ceiling joist to the underside of the sheathing at the roof ridge, and the ceiling is attached to the ceiling joist or the bottom of the truss or ceiling joist. Anything else is considered all other roofs.
4. **SHGC (Solar Heat Gain Coefficient per Section 1312.2):** May substitute Maximum Shading Coefficient (SC) for SHGC (See Chapter 2 for definition of Shading Coefficient).
5. **Radiant Floors:** Where insulation is required under the entire slab, radiant floors shall use a minimum of R-10 insulation or  $F = 0.55$  maximum. Where insulation is not required under the entire slab, radiant floors shall use R-10 perimeter insulation according to Section 1311.6 or  $F = 0.78$  maximum.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1334, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1334, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1334, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1334, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1334, filed 10/18/93, effective 4/1/94.]

**Reviser's note:** RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffective

tual changes not filed by the agency in this manner. The bracketed material in the above section does not appear to conform to the statutory requirement.

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

## CHAPTER 14 BUILDING MECHANICAL SYSTEMS

**WAC 51-11-1401 Scope.** This section covers the determination of requirements, system and component performance, control requirements and duct construction.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1401, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1401, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1402 Mechanical ventilation.** The minimum requirements for ventilation shall comply with the Washington State Ventilation and Indoor Air Quality Code (chapter 51-13 WAC).

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1402, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1410 General requirements.** The building mechanical system shall comply with Sections 1411 through 1416, Sections 1440 through 1443 and Sections 1450 through 1454, and with one of the following paths:

- a. Simple Systems (Packaged Unitary Equipment) Sections 1420 through 1424.
- b. Complex Systems Sections 1430 through 1439.
- c. Systems Analysis. See Section 1141.4.

FIGURE 14A  
Mechanical Systems Compliance Paths

Section Number	Subject	Simple Systems Path	Complex Systems Path	Systems Analysis Option
1410	General Requirements	X	X	X
1411	HVAC Equipment Performance Requirements	X	X	X
1412	Controls	X	X	X
1413	Air Economizers	X	X	X
1414	Ducting Systems	X	X	X
1415	Piping Systems	X	X	X
1416	Completion Requirements	X	X	X
1420	Simple Systems (Packaged Unitary Equipment)	X		
1421	System Type	X		
1422	Controls	X		
1423	Economizers	X		
1424	Separate Air Distribution Systems	X		
1430	Complex Systems		X	
1431	System Type		X	
1432	Controls		X	
1433	Economizers		X	
1434	Separate Air Distribution Systems		X	
1435	Simultaneous Heating and Cooling		X	
1436	Heat Recovery		X	
1437	Electric Motor Efficiency		X	
1438	Variable Flow Systems		X	
1439	Exhaust Hoods		X	
RS-29	Systems Analysis			X
1440	Service Water Heating	X	X	X

FIGURE 14A  
Mechanical Systems Compliance Paths

Section Number	Subject	Simple Systems Path	Complex Systems Path	Systems Analysis Option
1441	Water Heater Installation	X	X	X
1442	Shut Off Controls	X	X	X
1443	Pipe Insulation	X	X	X
1450	Heated Pools	X	X	X
1451	General	X	X	X
1452	Pool Water Heaters	X	X	X
1453	Controls	X	X	X
1454	Pool Covers	X	X	X

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1410, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1410, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1411 HVAC equipment performance requirements.

1411.1 General: Equipment shall have a minimum performance at the specified rating conditions not less than the values shown in Tables 14-1A through 14-1G. If a nationally recognized certification program exists for a product covered in Tables 14-1A through 14-1G, and it includes provisions for verification and challenge of equipment efficiency ratings, then the product shall be listed in the certification program.

Gas-fired and oil-fired forced air furnaces with input ratings  $\geq 225,000$  Btu/h (65 kW) and all unit heaters shall also have an intermittent ignition or interrupted device (IID), and have either mechanical draft (including power venting) or a flue damper. A vent damper is an acceptable alternative to a flue damper for furnaces where combustion air is drawn from the conditioned space. All furnaces with input ratings  $\geq 225,000$  Btu/h (65 kW), including electric furnaces, that are not located within the conditioned space shall have jacket losses not exceeding 0.75% of the input rating.

1411.2 Rating Conditions: Cooling equipment shall be rated at ARI test conditions and procedures when available. Where no applicable procedures exist, data shall be furnished by the equipment manufacturer.

1411.3 Combination Space and Service Water Heating: For combination space and service water heaters with a principal function of providing space heat, the Combined Annual Efficiency (CAE) may be calculated by using ASHRAE Standard 124-1991. Storage water heaters used in combination space heat and water heat applications shall have either an Energy Factor (EF) or a Combined Annual Efficiency (CAE) of not less than the following:

	Energy Factor (EF)	Combined Annual Efficiency (CAE)
< 50 gallon storage	0.58	0.71
50 to 70 gallon storage	0.57	0.71
> 70 gallon storage	0.55	0.70

1411.4 Packaged Electric Heating and Cooling Equipment: Packaged electric equipment providing both heating and

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cooling with a total cooling capacity greater than 20,000 Btu/h shall be a heat pump.

EXCEPTION: Unstaffed equipment shelters or cabinets used solely for personal wireless service facilities.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1411, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1411, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-1411, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1411, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1411, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1412 Controls.

1412.1 Temperature Controls: Each system shall be provided with at least one temperature control device. Each zone shall be controlled by individual thermostatic controls responding to temperature within the zone. At a minimum, each floor of a building shall be considered as a separate zone.

1412.2 Deadband Controls: When used to control both comfort heating and cooling, zone thermostatic controls shall be capable of a deadband of at least 5 degrees F within which the supply of heating and cooling energy to the zone is shut off or reduced to a minimum.

EXCEPTIONS:

1. Special occupancy, special usage, or code requirements where deadband controls are not appropriate.
2. Thermostats that require manual changeover between heating and cooling modes.

1412.3 Humidity Controls: If a system is equipped with a means for adding moisture, a humidistat shall be provided.

1412.4 Setback and Shutoff: HVAC systems shall be equipped with automatic controls capable of accomplishing a reduction of energy use through control setback or equipment shutdown during periods of nonuse or alternate use of the spaces served by the system. The automatic controls shall:

- a. Have a minimum seven-day clock and be capable of being set for seven different day types per week,
- b. Be capable of retaining programming and time setting during loss of power for a period of at least ten hours, and
- c. Include an accessible manual override, or equivalent function (e.g., telephone interface), that allows temporary operation of the system for up to two hours.

EXCEPTIONS:

1. Systems serving areas which require continuous operation at the same temperature setpoint.

2. Equipment with full load demands of 2 Kw (6,826 Btu/h) or less may be controlled by readily accessible manual off-hour controls.
3. Systems controlled by an occupant sensor that is capable of shutting the system off when no occupant is sensed for a period of up to 30 minutes.
4. Systems controlled solely by a manually operated timer capable of operating the system for no more than two hours.

1412.4.1 Dampers: Outside air intakes, exhaust outlets and relief outlets serving conditioned spaces shall be equipped with motorized dampers which close automatically when the system is off or upon power failure. Stair shaft and elevator shaft smoke relief openings shall be equipped with normally open (fails to open upon loss of power) dampers. These dampers shall remain closed until activated by the fire alarm system or other approved smoke detection system.

EXCEPTIONS:

1. Systems serving areas which require continuous operation.
2. Combustion air intakes.
3. Gravity (nonmotorized) dampers are acceptable in buildings less than 3 stories in height.
4. Gravity (nonmotorized) dampers are acceptable in exhaust and relief outlets in the first story and levels below the first story of buildings three or more stories in height.
5. Type I grease hoods exhaust.

Dampers installed to comply with this section, including dampers integral to HVAC equipment, shall have a maximum leakage rate when tested in accordance with AMCA Standard 500 of:

(a) Motorized dampers: 10 cfm/ft<sup>2</sup> of damper area at 1.0 in w.g.

(b) Nonmotorized dampers: 20 cfm/ft<sup>2</sup> of damper area at 1.0 in w.g., except that for nonmotorized dampers smaller than 24 inches in either dimension: 40 cfm/ft<sup>2</sup> of damper area at 1.0 in w.g.

Drawings shall indicate compliance with this section.

1412.4.2 Optimum Start Controls: Heating and cooling systems with design supply air capacities exceeding 10,000 cfm shall have optimum start controls. Optimum start controls shall be designed to automatically adjust the start time of an HVAC system each day to bring the space to desired occupancy. The control algorithm shall, as a minimum, be a function of the difference between space temperature and occupied setpoint and the amount of time prior to scheduled occupancy.

1412.5 Heat Pump Controls: Unitary air cooled heat pumps shall include microprocessor controls that minimize supplemental heat usage during start up, set-up, and defrost conditions. These controls shall anticipate need for heat and use compression heating as the first stage of heat. Controls shall indicate when supplemental heating is being used through visual means (e.g., LED indicators).

1412.6 Combustion Heating Equipment Controls: Combustion heating equipment with a capacity over 225,000 Btu/h shall have modulating or staged combustion control.

EXCEPTIONS:

- Boilers.
- Radiant heaters.

1412.7 Balancing: Each air supply outlet or air or water terminal device shall have a means for balancing, including but

not limited to, dampers, temperature and pressure test connections and balancing valves.

1412.8 Ventilation Controls for High-Occupancy Areas. Demand control ventilation (DCV) is required for spaces that are larger than 500 ft<sup>2</sup>, have a design occupancy for ventilation of greater than 40 people per 1000 ft<sup>2</sup> of floor area, and are served by systems with one or more of the following:

- a. An air-side economizer,
- b. Automatic modulating control of the outdoor air damper, or
- c. A design outdoor airflow greater than 3000 cfm.

EXCEPTIONS:

1. Systems with energy recovery complying with Section 1436.
2. Multiple-zone systems without direct-digital control of individual zones communicating with a central control panel.
3. Systems with a design outdoor airflow less than 1200 cfm.
4. Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1412, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1412, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1412, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-1412, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1412, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1412, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1413 Economizers.

1413.1 Operation: Air economizers shall be capable of automatically modulating outside and return air dampers to provide 100 percent of the design supply air as outside air to reduce or eliminate the need for mechanical cooling. Air economizers shall be used for RS-29 analysis base case for all systems without exceptions in Sections 1413, 1423, or 1433. Water economizers shall be capable of providing the total concurrent cooling load served by the connected terminal equipment lacking airside economizer, at outside air temperatures of 45°F dry-bulb/40°F wet-bulb and below. For this calculation, all factors including solar and internal load shall be the same as those used for peak load calculations, except for the outside temperatures.

EXCEPTION: Water economizers using air-cooled heat rejection equipment may use a 35°F dry-bulb outside air temperature for this calculation. This exception is limited to a maximum of 20 tons per building.

1413.2 **Documentation:** Water economizer plans submitted for approval shall include the following information:

1. Maximum outside air conditions for which economizer is sized to provide full cooling.
2. Design cooling load to be provided by economizer at this outside air condition.
3. Heat rejection and terminal equipment performance data including model number, flow rate, capacity, entering and leaving temperature in full economizer cooling mode.

1413.3 Integrated Operation: The HVAC system and its controls shall allow economizer operation when mechanical cooling is required simultaneously. Air and water economizers shall be capable of providing partial cooling even when

additional mechanical cooling is required to meet the remainder of the cooling load.

EXCEPTIONS:

1. Individual, direct expansion units that have a rated capacity less than 65,000 Btu/h and use nonintegrated economizer controls that preclude simultaneous operation of the economizer and mechanical cooling.
2. Water-cooled water chillers with waterside economizer.

**1413.4 Humidification:** If an air economizer is required on a cooling system for which humidification equipment is to be provided to maintain minimum indoor humidity levels, then the humidifier shall be of the adiabatic type (direct evaporative media or fog atomization type).

EXCEPTIONS:

1. Health care facilities where WAC 246-320-525 allows only steam injection humidifiers in ductwork downstream of final filters.
2. Systems with water economizer.
3. 100% outside air systems with no provisions for air recirculation to the central supply fan.
4. Nonadiabatic humidifiers cumulatively serving no more than 10% of a building's air economizer capacity as measured in cfm. This refers to the system cfm serving rooms with stand alone or duct mounted humidifiers.

[Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1413, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1413, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1413, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1414 Ducting systems.

**1414.1 Sealing:** Duct work which is designed to operate at pressures above 1/2 inch water column static pressure shall be sealed in accordance with Standard RS-18. Extent of sealing required is as follows:

1. Static pressure: 1/2 inch to 2 inches; seal transverse joints.
2. Static pressure: 2 inches to 3 inches; seal all transverse joints and longitudinal seams.
3. Static pressure: Above 3 inches; seal all transverse joints, longitudinal seams and duct wall penetrations.

Duct tape and other pressure sensitive tape shall not be used as the primary sealant where ducts are designed to operate at static pressures of 1 inch W.C. or greater.

**1414.2 Insulation:** Ducts and plenums that are constructed and function as part of the building envelope, by separating interior space from exterior space, shall meet all applicable requirements of Chapter 13. These requirements include insulation installation, moisture control, air leakage, and building envelope insulation levels. Unheated equipment rooms with combustion air louvers must be isolated from the conditioned space by insulating interior surfaces to a minimum of R-11 and any exterior envelope surfaces per Chapter 13. Outside air ducts serving individual supply air units with less than 2,800 cfm of total supply air capacity shall be insulated to a minimum of R-7 and are not considered building envelope. Other outside air duct runs are considered building envelope until they,

1. Connect to the heating or cooling equipment, or
2. Are isolated from the exterior with an automatic shut-off damper complying with Section 1412.4.1.

(2007 Ed.)

Once outside air ducts meet the above listed requirements, any runs within conditioned space shall comply with Table 14-5 requirements.

Other ducts and plenums shall be thermally insulated per Table 14-5.

EXCEPTIONS:

1. Within the HVAC equipment.
2. Exhaust air ducts not subject to condensation.
3. Exposed ductwork within a zone that serves that zone.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1414, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1414, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1414, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1415 Piping systems.

**1415.1 Insulation:** Piping shall be thermally insulated in accordance with Table 14-6.

EXCEPTION: Piping installed within unitary HVAC equipment.

Cold water pipes outside the conditioned space shall be insulated in accordance with the Washington State Plumbing Code (chapter 51-56 WAC).

[Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1415, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1415, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1415, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1416 Mechanical systems commissioning and completion requirements.

**1416.1 General:** Commissioning is a systematic process of verification and documentation that ensures that the selected building systems have been designed, installed, and function properly, efficiently, and can be maintained in accordance with the contract documents in order to satisfy the building owner's design intent and operational requirements. Drawing notes shall require commissioning and completion requirements in accordance with Section 1416. Drawing notes may refer to specifications for further requirements.

**1416.1.1 Simple Systems:** For simple systems, as defined in Section 1421, and for warehouses and semi-heated spaces, commissioning shall include, as a minimum:

- a. A Commissioning Plan,
- b. System Testing and Balancing,
- c. Controls Functional Performance Testing,
- d. A Preliminary Commissioning Report,
- e. Post Construction Documentation in the form of O&M and Record Drawing Review, and
- f. A Final Commissioning Report.

**1416.1.2 All Other Mechanical Systems:** For all other mechanical systems, commissioning shall include, as a minimum:

- a. A Commissioning Plan,
- b. System Testing and Balancing,
- c. Equipment Functional Performance Testing,
- d. Controls Functional Performance Testing,
- e. A Preliminary Commissioning Report,
- f. Post Construction Documentation (all), and
- g. A Final Commissioning Report.

**1416.2 Commissioning Requirements.**

1416.2.1 Commissioning Plan: The plans shall require tests mandated by this section be performed and the results recorded. The plans shall require preparation of preliminary and final reports of test procedures and results as described herein. At a minimum, the plans shall identify the following for each test:

- a. A detailed explanation of the original design intent,
- b. Equipment and systems to be tested, including the extent of tests,
- c. Functions to be tested (for example, calibration, economizer control, etc.),
- d. Conditions under which the test shall be performed (for example, winter and summer design conditions, full outside air, etc.),
- e. Measurable criteria for acceptable performance.

#### 1416.2.2 Systems Balancing.

1416.2.2.1 General: Construction documents shall require that all HVAC systems be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within 10% of design rates, except variable flow distribution systems need not be balanced upstream of the controlling device (for example, VAV box or control valve). Construction documents shall require a written balance report be provided to the owner. Drawing notes may refer to specifications for further systems balancing requirements.

1416.2.2.2 Air System Balancing: Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp, fan speed shall be adjusted to meet design flow conditions.

1416.2.2.3 Hydronic System Balancing: Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions.

EXCEPTIONS: 1. Pumps with pump motors of 10 hp or less.  
2. When throttling results in no greater than 5% of the nameplate horsepower draw above that required if the impeller were trimmed.

Each hydronic system shall have either the ability to measure pressure across the pump, or test ports at each side of each pump.

#### 1416.2.3 Functional Performance Testing.

1416.2.3.1 Equipment/Systems Testing: Functional Performance Testing shall demonstrate the correct installation and operation of each component, system, and system-to-system intertie relationship in accordance with approved plans and specifications. This demonstration is to prove the operation, function, and maintenance serviceability for each of the commissioned systems. Testing shall include all modes of operation, including:

- a. All modes as described in the Sequence of Operation,
- b. Redundant or automatic back-up mode,
- c. Performance of alarms, and
- d. Mode of operation upon a loss of power and restored power.

1416.2.3.2 Controls Testing: HVAC control systems shall be tested to ensure that control devices, components, equipment and systems are calibrated, adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to ensure they operate in accordance with approved plans and specifications.

#### 1416.2.4 Post Construction Commissioning.

1416.2.4.1 General: Construction documents shall require post construction commissioning be provided to the building owner. Drawing notes may refer to specifications for further commissioning requirements. Post construction commissioning shall include, as a minimum, review and approval of Operation and Maintenance Materials, Record Drawings, and Systems Operational Training.

1416.2.4.2 Operation and Maintenance (O&M) Manuals: The O&M manual shall be in accordance with industry accepted standards and shall include, at a minimum, the following:

- a. Submittal data stating equipment size and selected options for each piece of equipment requiring maintenance.
- b. Operation and maintenance manuals for each piece of equipment requiring maintenance, except equipment not furnished as part of the project. Required routine maintenance actions shall be clearly identified.
- c. Names and addresses of at least one service agency.
- d. HVAC controls system maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field determined set points shall be permanently recorded on control drawings at control devices, or, for digital control systems, in programming comments.
- e. A complete narrative of how each system is intended to operate including:
  - i. A detailed explanation of the original design intent.
  - ii. The basis of design (how the design was selected to meet the design intent).
  - iii. A detailed explanation of how new equipment is to interface with existing equipment or systems (where applicable).
  - iv. Suggested set points.

Note: Sequence of Operation is not acceptable as narrative for this requirement.

1416.2.4.3 Record Drawings: Record drawings shall include as a minimum the location and performance data on each piece of equipment, general configuration of duct and pipe distribution system, including sizes, and the terminal air and water design flow rates of the actual installation.

1416.2.4.4 Systems Operational Training: The training of the appropriate maintenance staff for each equipment type and/or system shall include, as a minimum, the following:

- a. System/Equipment overview (what it is, what it does and which other systems and/or equipment does it interface with).
- b. Review of the available O&M materials.
- c. Review of the Record Drawings on the subject system/equipment.

d. Hands-on demonstration of all normal maintenance procedures, normal operating modes, and all emergency shut-down and start-up procedures.

#### 1416.2.5 Commissioning Reports.

1416.2.5.1 Preliminary Commissioning Report: A preliminary report of commissioning test procedures and results shall be completed and provided to the owner. The preliminary commissioning report shall identify:

a. Deficiencies found during testing required by this section which have not been corrected at the time of report preparation and the anticipated date of correction.

b. Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.

c. Climatic conditions required for performance of the deferred tests, and the anticipated date of each deferred test.

1416.2.5.2 Final Commissioning Report: A complete report of test procedures and results shall be prepared and filed with the owner. The Final Commissioning Report shall identify:

a. Results of all Functional Performance Tests.

b. Disposition of all deficiencies found during testing, including details of corrective measures used or proposed.

c. All Functional Performance Test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.

**EXCEPTION:** Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.

#### 1416.3 Acceptance Requirements.

1416.3.1 Acceptance: Buildings or portions thereof, required by this code to comply with this section, shall not be issued a final certificate of occupancy until such time that the building official determines that the preliminary commissioning report required by Section 1416.2.5.1 has been completed.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1416, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1416, filed 1/5/01, effective 7/1/01.]

#### **WAC 51-11-1420 Simple systems (packaged unitary equipment).**

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1420, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1421 System type.** To qualify as a simple system, systems shall be one of the following:

- Air cooled, constant volume packaged equipment, which provide heating, cooling or both, and require only external connection to duct work and energy services.
- Air cooled, constant volume split systems, which provide heating, cooling or both, with cooling capacity of 84,000 Btu/h or less.
- Heating only systems which have a capacity of less than 5,000 cfm or which have a minimum outside air supply of less than 70 percent of the total air circulation.

All other systems shall comply with Sections 1430 through 1438.

(2007 Ed.)

[Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-1421, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1421, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1422 Controls.** In addition to the control requirements in Section 1412, where separate heating and cooling equipment serve the same temperature zone, thermostats shall be interlocked to prevent simultaneous heating and cooling. Systems which provide heating and cooling simultaneously to a zone are prohibited.

[Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-1422, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1422, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1423 Economizers.** Economizers meeting the requirements of Section 1413 shall be installed on:

a. Cooling units installed outdoors or in a mechanical room adjacent to outdoors having a total cooling capacity greater than 20,000 Btu/h including those serving computer server rooms, electronic equipment, radio equipment, telephone switchgear; and

b. Other cooling units with a total cooling capacity greater than 54,000 Btu/h, including those serving computer server rooms, electronic equipment, radio equipment, and telephone switchgear.

**Exception:** For Group R Occupancy, economizers meeting the requirements of Section 1413 shall be installed on single package unitary fan-cooling units having a total cooling capacity greater than 54,000 Btu/h.

The total capacity of all units without economizers (i.e., those units with a total cooling capacity less than a. and b. above) shall not exceed 240,000 Btu/h per building, or 10% of its aggregate cooling (economizer) capacity, whichever is greater. That portion of the equipment serving Group R Occupancy is not included in determining the total capacity of all units without economizers in a building.

[Statutory Authority: RCW 19.27A.025, 19.27A.045, and chapters 19.27, 19.27A and 34.05 RCW. 05-23-103, § 51-11-1423, filed 11/17/05, effective 7/1/06; 05-01-013, § 51-11-1423, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1423, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-1423, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1423, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1423, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1424 Separate air distribution systems.** Zones with special process temperature requirements and/or humidity requirements shall be served by separate air distribution systems from those serving zones requiring only comfort conditions.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1424, filed 10/18/93, effective 4/1/94.]

#### **WAC 51-11-1430 Complex systems.**

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1430, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1431 System type.** All systems not qualifying for Sections 1420 through 1424 (Simple Systems), including field fabricated and constructed of system components, shall comply with Sections 1430 through 1438. Simple systems may also comply with Sections 1430 through 1438.



1431.1 Field-Assembled Equipment and Components: Field-assembled equipment and components from more than one manufacturer shall show compliance with this section and Section 1411 through calculations of total on-site energy input and output. The combined component efficiencies as measured per Section 1411.2, shall be in compliance with the requirements of Section 1411.1.

Total on-site energy input to the equipment shall be determined by combining the energy inputs to all components, elements, and accessories such as compressor(s), internal circulating pump(s), purge devices, viscosity control heaters, and controls.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1431, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1432 Controls.

1432.1 Setback and Shutoff: Systems that serve zones with different uses, as defined in Table 15-1

1. Shall be served by separate systems, or
2. Shall include isolation devices and controls to shut off or set back the supply of heating and cooling to each zone independently.

EXCEPTION: Isolation or separate systems are not required for zones expected to operate continuously or expected to be inoperative only when all other zones are inoperative.

1432.2 Systems Temperature Reset Controls

1432.2.1 Air Systems for Multiple Zones: Systems supplying heated or cooled air to multiple zones shall include controls which automatically reset supply air temperatures by representative building loads or by outside air temperature. Temperature shall be reset by at least 25 percent of the design supply-air-to-room-air temperature difference.

EXCEPTION: Where specified humidity levels are required to satisfy process needs, such as computer rooms or museums.

1432.2.2 Hydronic Systems: Systems with a design capacity of 300,000 Btu/h or greater supplying heated or mechanically refrigerated water shall include controls which automatically reset supply water temperatures by representative building loads (including return water temperature) or by outside air temperature. Temperature shall be reset by at least 25 percent of the design supply-to-return water temperature differences.

EXCEPTIONS:

1. Hydronic systems that use variable flow devices complying with Section 1438 to reduce pumping energy.
2. Steam boilers.
3. Systems that provide heating with 100°F or lower supply temperature (e.g., water source heat pump loops).

To limit the heat loss from the heat rejection device (cooling tower), for hydronic heat pumps connected to a common heat pump water loop with central devices for heat rejection (e.g., cooling tower):

- a. If a closed-circuit tower (fluid cooler) is used, either an automatic valve shall be installed to bypass all but a minimal flow of water around the tower (for freeze protection), or low leakage positive closure dampers shall be provided.

b. If an open-circuit tower is used directly in the heat pump loop, an automatic valve shall be installed to bypass all heat pump water flow around the tower.

c. If an open-circuit tower is used in conjunction with a separate heat exchanger to isolate the tower from the heat pump loop, then heat loss shall be controlled by shutting down the circulation pump on the cooling tower loop.

For hydronic heat pumps connected to a common heat pump water loop with central devices for heat rejection (e.g., cooling tower) and having a total pump system power exceeding 10 hp, each hydronic heat pump shall have:

- a. A two-position two-way (but not three-way) valve, or
- b. A variable head pressure two-way (water regulating) control valve or pump.

For the purposes of this section, pump system power is the sum of the nominal power demand (i.e., nameplate horsepower at nominal motor efficiency) of motors of all pumps that are required to operate at design conditions to supply fluid from the heating or cooling source to all heat transfer devices (e.g., coils, heat exchanger) and return it to the source. This converts the system into a variable flow system and, as such, the primary circulation pumps shall comply with the variable flow requirements in Section 1438.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1432, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1432, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1433 Economizers.** Air economizers meeting the requirements of Section 1413 shall be provided on all new systems including those serving computer server rooms, electronic equipment, radio equipment, telephone switchgear.

EXCEPTIONS:

1. High-efficiency cooling units with SEER and EER values more than 10% higher than minimum efficiencies listed in Tables 14-1A, 14-1B and 14-1D, in the appropriate size category, using the same test procedures. The total capacity of all systems without economizers shall not exceed 480,000 Btu/h per building, or 20% of its air economizer capacity, whichever is greater. That portion of the equipment serving Group R Occupancy is not included in determining the total capacity of all units without economizers in a building. This exception shall not be used for RS-29 analysis nor include unitary cooling equipment installed outdoors nor in a mechanical room adjacent to outdoors.
2. Chilled water terminal units connected to systems with chilled water generation equipment with COP and IPLV values more than 10% higher than minimum efficiencies listed in Table 14-1C, in the appropriate size category, using the same test procedures. The total capacity of all systems without economizers shall not exceed 480,000 Btu/h per building, or 20% of its air economizer capacity, whichever is greater. That portion of the equipment serving Group R Occupancy is not included in determining the total capacity of all units without economizers in a building. This exception shall not be used for RS-29 analysis.
3. Water-cooled refrigeration equipment provided with a water economizer meeting the requirements of Section 1413. Water economizer capacity per building shall not exceed 500 tons. This exception shall not be used for RS-29 analysis.
4. Systems for which at least 75% of the annual energy used for mechanical cooling is provided from site-recovery or site-solar energy source.
5. Systems where special outside air filtration and treatment, for the reduction and treatment of unusual outdoor contaminants, makes an air economizer infeasible.

6. Systems that affect other systems (such as dehumidification and supermarket refrigeration systems) so as to increase the overall building energy consumption. New humidification equipment shall comply with Section 1413.4.

7. Systems complying with all of the following criteria:

- a. Consist of multiple water source heat pumps connected to a common water loop;
- b. Have a minimum of 60% air economizer;
- c. Have water source heat pumps with an EER at least 15% higher for cooling and a COP at least 15% higher for heating than that specified in Section 1411;
- d. Where provided, have a central boiler or furnace efficiency of:

- i. 90% minimum for units up to 199,000 Btu/h; and
- ii. 85% minimum for units above 199,000 Btu/h input; and

e. Provide heat recovery with a minimum 50% heat recovery effectiveness as defined in Section 1436 to preheat the outside air supply.

8. For Group R Occupancy, cooling units installed outdoors or in a mechanical room adjacent to outdoors with a total cooling capacity less than 20,000 Btu/h and other cooling units with a total cooling capacity less than 54,000 Btu/h.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW, 07-01-089, § 51-11-1433, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW, 05-01-013, § 51-11-1433, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045, 02-01-112, § 51-11-1433, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-1433, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1433, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1433, filed 10/18/93, effective 4/1/94.]

#### **WAC 51-11-1434 Separate air distribution systems.**

Zones with special process temperature requirements and/or humidity requirements shall be served by separate air distribution systems from those serving zones requiring only comfort conditions; or shall include supplementary control provisions so that the primary systems may be specifically controlled for comfort purposes only.

**EXCEPTION:** Zones requiring only comfort heating or comfort cooling that are served by a system primarily used for process temperature and humidity control provided that:

- 1. The total supply air to those comfort zones is no more than 25 percent of the total system supply air, or
- 2. The total conditioned floor area of the zones is less than 1,000 ft<sup>2</sup>.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1434, filed 10/18/93, effective 4/1/94.]

#### **WAC 51-11-1435 Simultaneous heating and cooling.**

Systems which provide heating and cooling simultaneously to a zone are prohibited. Zone thermostatic and humidistatic controls shall be capable of operating in sequence the supply of heating and cooling energy to the zone. Such controls shall prevent:

- a. Reheating for temperature control.
- b. Recooling for temperature control.
- c. Mixing or simultaneous supply of air that has been previously mechanically heated and air that has been previously cooled, either by economizer systems or by mechanical refrigeration.
- d. Other simultaneous operation of heating and cooling systems to the same zone.
- e. Reheating for humidity control.

**EXCEPTIONS:** 1. Zones for which the volume of air that is reheated, recooled, or mixed is no greater than the larger of the following:

i. The volume of air required to meet the ventilation requirements of the Washington State Ventilation and Indoor Air Quality Code for the zone.

ii. 0.4 cfm/ft<sup>2</sup> of the zone conditioned floor area, provided that the temperature of the primary system air is, by design or through reset controls, 0-12°F below the design space heating temperature when outside air temperatures are below 60°F for reheat systems and the cold deck of mixing systems and 0-12°F above design space temperature when outside air temperatures are above 60°F for recooling systems and the hot deck of mixing systems. For multiple zone systems, each zone need not comply with this exception provided the average of all zones served by the system that have both heating and cooling ability comply.

iii. 300 cfm. This exception is for zones whose peak flow rate totals no more than 10% of the total fan system flow rate.

iv. Any higher rate that can be demonstrated, to the satisfaction of the building official, to reduce overall system annual energy usage by offsetting reheat/recool energy losses through a reduction in outdoor air intake in accordance with the multiple space requirements defined in ASHRAE Standard 62.

2. Zones where special pressurization relationships, cross-contamination requirements, or code-required minimum circulation rates are such that variable air volume systems are impractical.

3. Zones where at least 75% of the energy for reheating or for providing warm air in mixing systems is provided from a site-recovered (including condenser heat) or site solar energy source.

4. Zones where specific humidity levels are required to satisfy process needs, such as computer rooms, museums, surgical suites, and buildings with refrigerating systems, such as supermarkets, refrigerated warehouses, and ice arenas.

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1435, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1435, filed 10/18/93, effective 4/1/94.]

#### **WAC 51-11-1436 Heat recovery.**

Fan systems which have both a capacity of 5,000 cfm or greater and which have a minimum outside air supply of 70 percent or greater of the total air circulation shall have a heat recovery system with at least 50 percent recovery effectiveness. Fifty percent heat recovery effectiveness shall mean an increase in the outside air supply temperature at design heating conditions of one half the difference between the outdoor design air temperature and 65 degrees F. Provision shall be made to bypass or control the heat recovery system to permit air economizer operation as required by Section 1433. Heat recovery energy may be provided from any site-recovered or site-solar source.

##### **EXCEPTIONS:**

- 1. Laboratory systems equipped with both variable air volume supply and variable air volume or two-speed exhaust fume hoods.
- 2. Systems serving spaces heated to less than 60 degrees F.
- 3. Systems which can be shown to use as much energy with the addition of heat recovery equipment as without it.
- 4. Systems exhausting toxic, flammable, paint exhaust or corrosive fumes making the installation of heat recovery equipment impractical.
- 5. Type I commercial kitchen hoods.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1436, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1437 Electric motor efficiency.** Design A & B squirrel-cage, T-frame induction permanently wired polyphase motors of 1 hp or more having synchronous speeds of 3,600, 1,800 and 1,200 rpm shall have a nominal full-load motor efficiency no less than the corresponding values for energy efficient motors provided in Table 14-4.

## EXCEPTIONS:

1. Motors used in systems designed to use more than one speed of a multispeed motor.
2. Motors used as a component of the equipment meeting the minimum equipment efficiency requirements of Section 1411 and Tables 14-1A through 14-1G provided that the motor input is included when determining the equipment efficiency.
3. Motors that are an integral part of specialized process equipment.
4. Where the motor is integral to a listed piece of equipment for which no complying motor has been approved.

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 02-01-112, § 51-11-1437, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1437, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1438 Variable flow systems and system criteria.** For fans and pumps greater than 10 horsepower, where the application involves variable flow, and water source heat pump loops subject to the requirements of Section 1432.2.2, there shall be:

- a. Variable speed drives, or
- b. Other controls and devices that will result in fan and pump motor demand of no more than 30% of design wattage at 50% of design air volume for fans when static pressure set point equals 1/3 the total design static pressure, and 50% of design water flow for pumps, based on manufacturer's certified test data. Variable inlet vanes, throttling valves (dampers), scroll dampers or bypass circuits shall not be allowed.

Static pressure sensors used to control variable air volume fans shall be placed in a position such that the controller set point is no greater than 1/3 the total design fan static pressure.

For systems with direct digital control of individual zone boxes reporting to the central control panel, there shall be static pressure reset controls and the static pressure set point shall be reset based on the zone requiring the most pressure; i.e., the set point is reset lower until one zone damper is nearly wide open.

**1438.1 Cooling Towers:** All cooling towers with a total fan motor horsepower greater than 10 hp shall be equipped with a variable speed drive or with a pony motor of a rated hp no greater than 1/3 of the hp of the primary motor. For pony motors, the cooling tower control shall provide two-stage operation of fans and shall bring on the pony motor to operate without the primary motor while meeting the condenser water setpoint.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW, 07-01-089, § 51-11-1438, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1438, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1438, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1439 Exhaust hoods.

**1439.1 Kitchen Hoods.** Individual kitchen exhaust hoods larger than 5000 cfm shall be provided with make-up air sized so that at least 50% of exhaust air volume be (a) unheated or heated to no more than 60°F and (b) uncooled or cooled without the use of mechanical cooling.

## EXCEPTIONS:

1. Where hoods are used to exhaust ventilation air which would otherwise exfiltrate or be exhausted by other fan systems.
2. Certified grease extractor hoods that require a face velocity no greater than 60 fpm.

**1439.2 Fume Hoods.** Each fume hood in buildings with fume hood systems having a total exhaust rate greater than 15,000 cfm shall include at least one of the following features:

- (a) Variable air volume hood exhaust and room supply systems capable of reducing exhaust and make-up air volume to 50% or less of design values.
- (b) Direct make-up (auxiliary) air supply equal to at least 75% of the exhaust rate, heated no warmer than 2°F below room set point, cooled to no cooler than 3°F above room set point, no humidification added, and no simultaneous heating and cooling used for dehumidification control.
- (c) Heat recovery systems to precondition make-up air in accordance with Section 1436, without using any exception.
- (d) Constant volume fume hood designed and installed to operate at less than 50 fpm face velocity.

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1439, filed 1/5/01, effective 7/1/01.]

### WAC 51-11-1440 Service water heating.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1440, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1441 Water heater installation.** Electric water heaters in unconditioned spaces or on concrete floors shall be placed on an incompressible, insulated surface with a minimum thermal resistance of R-10.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1441, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1442 Shut-off controls.** Systems designed to maintain usage temperatures in hot water pipes, such as circulating hot water systems or heat traced pipes shall be equipped with automatic time switches or other controls to turn off the system during periods of nonuse.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1442, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1443 Pipe insulation.** Piping shall be thermally insulated in accordance with Section 1415.1.

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1443, filed 1/5/01, effective 7/1/01.]

### WAC 51-11-1450 Heated pools.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1450, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1451 General.** The requirements in this section apply to "general and limited use pools" as defined in the Washington Water Recreation Facilities Regulations (chapter 246-260 WAC).

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1451, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1452 Pool water heaters.** Heat pump pool heaters shall have a minimum COP of 4.0 determined in accordance with ASHRAE Standard 146, Method of Testing for Rating Pool Heaters. Other pool heating equipment shall comply with the applicable efficiencies in Tables 14-1A through 14-1G.

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 02-01-112, § 51-11-1452, filed 12/18/01, effective 7/1/02; 98-03-003, § 51-11-1452, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1452, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1453 Controls.** All pool heaters shall be equipped with readily accessible ON/OFF switch to allow shutting off the operation of the heater without adjusting the thermostat setting. Controls shall be provided to allow the

water temperature to be regulated from the maximum design temperature down to 65 degrees F.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1453, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1454 Pool covers.** Heated pools shall be equipped with a vapor retardant pool cover on or at the water surface. Pools heated to more than 90 degrees F shall have a pool cover with a minimum insulation value of R-12.

**Table 14-1A**  
**Unitary Air Conditioners and Condensing Units, Electrically Operated, Minimum Efficiency Requirements**

Equipment Type	Size Category	Sub-Category or Rating Condition	Minimum Efficiency <sup>b</sup>	Test Procedure <sup>a</sup>
Air Conditioners, Air Cooled	< 65,000 Btu/h <sup>d</sup>	Split System	13.0 SEER	ARI 210/240
		Single Package	13.0 SEER	
	≥ 65,000 Btu/h and < 135,000 Btu/h	Split System and Single Package On or after Jan 1, 2010 <sup>e</sup>	10.3 EER <sup>c</sup> 10.6 IPLV <sup>c</sup> 11.2 EER <sup>c</sup>	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Split System and Single Package On or after Jan 1, 2010 <sup>e</sup>	9.7 EER <sup>c</sup> 9.9 IPLV <sup>c</sup> 11.0 EER <sup>c</sup>	ARI 340/360
	≥ 240,000 Btu/h and < 760,000 Btu/h	Split System and Single Package On or after Jan 1, 2010 <sup>e</sup>	9.5 EER <sup>c</sup> 9.7 IPLV <sup>c</sup> 10.0 EER <sup>c</sup>	
	≥ 760,000 Btu/h	Split System and Single Package On or after Jan 1, 2010 <sup>e</sup>	9.2 EER <sup>c</sup> 9.4 IPLV <sup>c</sup> 9.7 EER <sup>c</sup>	
Through-the-Wall, Air Cooled	< 30,000 Btu/h <sup>d</sup>	Split System On or after January 23, 2010 <sup>e</sup>	10.9 SEER 12.0 SEER	ARI 210/240
		Single Package On or after January 23, 2010 <sup>e</sup>	10.6 SEER 12.0 SEER	
Small-Duct High-Velocity, Air Cooled	< 65,000 Btu/h <sup>d</sup>	Split System	10.0 SEER	ARI 210/240
Air Conditioners, Water and Evaporatively Cooled	< 65,000 Btu/h	Split System and Single Package	12.1 EER	ARI 210/240
	≥ 65,000 Btu/h and < 135,000 Btu/h	Split System and Single Package	11.5 EER <sup>c</sup>	
	≥ 135,000 Btu/h and ≤ 240,000 Btu/h	Split System and Single Package	11.0 EER <sup>c</sup>	ARI 340/360
	> 240,000 Btu/h	Split System and Single Package	11.0 EER <sup>c</sup> 10.3 IPLV <sup>c</sup>	
Condensing Units, Air Cooled	≥ 135,000 Btu/h		10.1 EER 11.2 IPLV	ARI 365
Condensing Units, Water or Evaporatively Cooled	≥ 135,000 Btu/h		13.1 EER 13.1 IPLV	

<sup>a</sup> Reserved.

<sup>b</sup> IPLVs are only applicable to equipment with capacity modulation.

<sup>c</sup> Deduct 0.2 from the required EERs and IPLVs for units with a heating section other than electric resistance heat.

<sup>d</sup> Applies to all units, including single-phase and three-phase. For single-phase air-cooled air-conditioners < 65,000 Btu/h, SEER values are those set by NAECA.

<sup>e</sup> Date of manufacture, as regulated by NAECA.

**Table 14-1B**  
**Unitary and Applied Heat Pumps, Electrically Operated, Minimum Efficiency Requirements**

Equipment Type	Size Category	Sub-Category or Rating Condition	Minimum Efficiency <sup>b</sup>	Test Procedure <sup>a</sup>
Air Cooled, (Cooling Mode)	< 65,000 Btu/h <sup>d</sup>	Split System	13.0 SEER	ARI 210/240
		Single Package	13.0 SEER	
	≥ 65,000 Btu/h and < 135,000 Btu/h	Split System and Single Package On or after Jan 1, 2010 <sup>e</sup>	10.1 EER <sup>c</sup> 10.4 IPLV <sup>c</sup> 11.0 EER <sup>c</sup>	ARI 340/360
	≥ 135,000 Btu/h and < 240,000 Btu/h	Split System and Single Package On or after Jan 1, 2010 <sup>e</sup>	9.3 EER <sup>c</sup> 9.5 IPLV <sup>c</sup> 10.6 EER <sup>c</sup>	
	≥ 240,000 Btu/h	Split System and Single Package On or after Jan 1, 2010 <sup>e</sup>	9.0 EER <sup>c</sup> 9.2 IPLV <sup>c</sup> 9.5 EER <sup>c</sup>	
Through-the-Wall (Air Cooled, Cooling Mode)	< 30,000 Btu/h <sup>d</sup>	Split System	10.9 SEER	ARI 210/240
		On or after January 23, 2010 <sup>e</sup>	12.0 SEER	
		Single Package On or after January 23, 2010 <sup>e</sup>	10.6 SEER 12.0 SEER	
Small-Duct High-Velocity (Air Cooled, Cooling Mode)	< 65,000 Btu/h <sup>d</sup>	Split System	10.0 SEER	ARI 210/240
Water-Source (Cooling Mode)	< 17,000 Btu/h	86°F Entering Water	11.2 EER	ARI/ISO-13256-1
	≥ 17,000 Btu/h and < 65,000 Btu/h	86°F Entering Water	12.0 EER	ARI/ISO-13256-1
	≥ 65,000 Btu/h and < 135,000 Btu/h	86°F Entering Water	12.0 EER	ARI/ISO-13256-1
Groundwater-Source (Cooling Mode)	< 135,000 Btu/h	59°F Entering Water	16.2 EER	ARI/ISO-13256-1
Ground Source (Cooling Mode)	< 135,000 Btu/h	77°F Entering Water	13.4 EER	ARI/ISO-13256-1
Air Cooled (Heating Mode)	< 65,000 Btu/h <sup>d</sup> (Cooling Capacity)	Split System	HSPF	ARI 210/240
			7.7 HSPF	
		Single Package	7.7 HSPF	
	≥ 65,000 Btu/h and < 135,000 Btu/h (Cooling Capacity)	47°F db/43°F wb Outdoor Air On or after January 1, 2010 <sup>e</sup>	3.2 COP 3.3 COP	ARI 340/360
		17°F db/15°F wb Outdoor Air	2.2 COP	
	≥ 135,000 Btu/h (Cooling Capacity)	47°F db/43°F wb Outdoor Air On or after January 1, 2010 <sup>e</sup>	3.1 COP 3.2 COP	
Through-the-Wall (Air Cooled, Heating Mode)	< 30,000 Btu/h <sup>d</sup>	17°F db/15°F wb Outdoor Air	2.0 COP	ARI 210/240
		Split System	7.1 HSPF	
		On or after January 23, 2010 <sup>e</sup>	7.4 HSPF	
		Single Package On or after January 23, 2010 <sup>e</sup>	7.0 HSPF 7.4 HSPF	

Equipment Type	Size Category	Sub-Category or Rating Condition	Minimum Efficiency <sup>b</sup>	Test Procedure <sup>a</sup>
Small-Duct High-Velocity (Air Cooled, Heating Mode)	< 65,000 Btu/h <sup>d</sup>	Split System	6.8 HSPF	ARI 210/240
Water-Source (Heating Mode)	< 135,000 Btu/h (Cooling Capacity)	68°F Entering Water	4.2 COP	ARI/ISO-13256-1
Groundwater-Source (Heating Mode)	< 135,000 Btu/h (Cooling Capacity)	50°F Entering Water	3.6 COP	ARI/ISO-13256-1
Ground Source (Heating Mode)	< 135,000 Btu/h (Cooling Capacity)	32°F Entering Water	3.1 COP	ARI/ISO-13256-1

<sup>a</sup> Reserved.

<sup>b</sup> IPLVs and part load rating conditions are only applicable to equipment with capacity modulation.

<sup>c</sup> Deduct 0.2 from the required EERs and IPLVs for units with a heating section other than electric resistance heat.

<sup>d</sup> Applies to all units, including single-phase and three-phase. For single-phase air-cooled heat pumps < 65,000 Btu/h, SEER and HSPF values are those set by NAECA.

<sup>e</sup> Date of manufacture, as regulated by NAECA.

**Table 14-1C**  
**Water Chilling Packages, Minimum Efficiency Requirements**

Equipment Type	Size Category	Sub-Category or Rating Condition	Minimum Efficiency <sup>b</sup>	Test Procedure <sup>a</sup>
Air Cooled, With Condenser, Electrically Operated	All Capacities		2.80 COP 3.05 IPLV	ARI 550/590
Air Cooled, Without Condenser, Electrically Operated	All Capacities		3.10 COP 3.45 IPLV	
Water Cooled, Electrically Operated, Positive Displacement (Reciprocating)	All Capacities		4.20 COP 5.05 IPLV	ARI 550/590
Water Cooled, Electrically Operated, Positive Displacement (Rotary Screw and Scroll)	< 150 Tons		4.45 COP 5.20 IPLV	ARI 550/590
	≥ 150 Tons and < 300 Tons		4.90 COP 5.60 IPLV	
	≥ 300 Tons		5.50 COP 6.15 IPLV	
Water Cooled, Electrically Operated, Centrifugal	< 150 Tons		5.00 COP 5.25 IPLV	ARI 550/590
	≥ 150 Tons and < 300 Tons		5.55 COP 5.90 IPLV	
	≥ 300 Tons		6.10 COP 6.40 IPLV	
Air Cooled Absorption Single Effect	All Capacities		0.60 COP	ARI 560
Water Cooled Absorption Single Effect	All Capacities		0.70 COP	
Absorption Double Effect, Indirect-Fired	All Capacities		1.00 COP 1.05 IPLV	
Absorption Double Effect, Direct-Fired	All Capacities		1.00 COP 1.00 IPLV	

<sup>a</sup> Reserved.

<sup>b</sup> The chiller equipment requirements do not apply for chillers used in low temperature applications where the design leaving fluid temperature is less than or equal to 40°F.

Table 14-1D

**Packaged Terminal Air Conditioners, Packaged Terminal Heat Pumps, Room Air Conditioners, and Room Air Conditioner Heat Pumps, Electrically Operated, Minimum Efficiency Requirements**

Equipment Type	Size Category (Input)	Sub-Category or Rating Condition	Minimum Efficiency <sup>b</sup>	Test Procedure <sup>a</sup>
PTAC (Cooling Mode) New Construction	All Capacities	95°F db Outdoor Air	12.5 - (0.213 x Cap/1000) <sup>b</sup> EER	ARI 310/380
PTAC (Cooling Mode) Replacements <sup>c</sup>	All Capacities	95°F db Outdoor Air	10.9 - (0.213 x Cap/1000) <sup>b</sup> EER	
PTHP (Cooling Mode) New Construction	All Capacities	95°F db Outdoor Air	12.3 - (0.213 x Cap/1000) <sup>b</sup> EER	
PTHP (Cooling Mode) Replacements <sup>c</sup>	All Capacities	95°F db Outdoor Air	10.8 - (0.213 x Cap/1000) <sup>b</sup> EER	
PTHP (Heating Mode) New Construction	All Capacities		3.2 - (0.026 x Cap/1000) <sup>b</sup> COP	
PTHP (Heating Mode) Replacements <sup>c</sup>	All Capacities		2.9 - (0.026 x Cap/1000) <sup>b</sup> COP	
SPVAC (Cooling Mode)	All Capacities	95°F db/75°F wb Outdoor Air	8.6 EER	ARI-390
SPVHP (Cooling Mode)	All Capacities	95°F db/75°F wb Outdoor Air	8.6 EER	
SPVAC (Heating Mode)	All Capacities	47°F db/43°F wb Outdoor Air	2.7 COP	
Room Air Conditioners, with Louvered Sides	< 6,000 Btu/h		9.7 EER	ANSI/AHAM RAC-1
	≥ 6,000 Btu/h and < 8,000 Btu/h		9.7 EER	
	≥ 8,000 Btu/h and < 14,000 Btu/h		9.8 EER	
	≥ 14,000 Btu/h and < 20,000 Btu/h		9.7 EER	
	≥ 20,000 Btu/h		8.5 EER	
Room Air Conditioners, without Louvered Sides	< 8,000 Btu/h		9.0 EER	
	≥ 8,000 Btu/h and < 20,000 Btu/h		8.5 EER	
	≥ 20,000 Btu/h		8.5 EER	
Room Air Conditioner Heat Pumps with Louvered Sides	< 20,000 Btu/h		9.0 EER	
	≥ 20,000 Btu/h		8.5 EER	
Room Air Conditioner Heat Pumps without Louvered Sides	< 14,000 Btu/h		8.5 EER	
	≥ 14,000 Btu/h		8.0 EER	
Room Air Conditioner, Casement Only Room Air Conditioner, Casement – Slider	All Capacities		8.7 EER	
	All Capacities		9.5 EER	

<sup>a</sup> Reserved.<sup>b</sup> Cap means the rated cooling capacity of the product in Btu/h. If the unit's capacity is less than 7000 Btu/h, use 7000 Btu/h in the calculation. If the unit's capacity is greater than 15,000 Btu/h, use 15,000 Btu/h in the calculation.<sup>c</sup> Replacement units must be factory labeled as follows: "MANUFACTURED FOR REPLACEMENT APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW CONSTRUCTION PROJECTS." Replacement efficiencies apply only to units with existing sleeves less than 16-in. high and less than 42-in. wide.<sup>d</sup> Casement room air conditioners are not separate product classes under current minimum efficiency column.<sup>e</sup> New room air conditioner standards, covered by NAECA became effective October 1, 2000.

Table 14-1E

**Warm Air Furnaces and Combination Warm Air Furnaces/Air-Conditioning Units, Warm Air Duct Furnaces and Unit Heaters, Minimum Efficiency Requirements**

Equipment Type	Size Category (Input)	Sub-Category or Rating Condition	Minimum Efficiency <sup>b</sup>	Test Procedure <sup>a</sup>
Warm Air Furnace, Gas-Fired	< 225,000 Btu/h (66 kW)		78% AFUE or 80% E <sub>t</sub> <sup>c</sup>	DOE 10 CFR Part 430 or ANSI Z21.47
	≥ 225,000 Btu/h (66 kW)	Maximum Capacity <sup>c</sup> Minimum Capacity <sup>c</sup>	80% E <sub>c</sub> <sup>f</sup>	ANSI Z21.47
Warm Air Furnace, Oil-Fired	< 225,000 Btu/h (66 kW)		78% AFUE or 80% E <sub>t</sub> <sup>c</sup>	DOE 10 CFR Part 430 or UL 727
	≥ 225,000 Btu/h (66 kW)	Maximum Capacity <sup>b</sup> Minimum Capacity <sup>b</sup>	81% E <sub>t</sub> <sup>g</sup> —	UL 727
Warm Air Duct Furnaces, Gas-Fired	All Capacities	Maximum Capacity <sup>b</sup> Minimum Capacity <sup>b</sup>	80% E <sub>c</sub> <sup>e</sup> —	ANSI Z83.9
Warm Air Unit Heaters, Gas-Fired	All Capacities	Maximum Capacity <sup>b</sup> Minimum Capacity <sup>b</sup>	80% E <sub>c</sub> <sup>e</sup> —	ANSI Z83.8
Warm Air Unit Heaters, Oil-Fired	All Capacities	Maximum Capacity <sup>b</sup> Minimum Capacity <sup>b</sup>	80% E <sub>c</sub> <sup>e</sup> —	UL 731

<sup>a</sup> Reserved.<sup>b</sup> Minimum and maximum ratings as provided for and allowed by the unit's controls.<sup>c</sup> Combination units not covered by NAECA (3-phase power or cooling capacity greater than or equal to 65,000 Btu/h [19 kW]) may comply with either rating.<sup>d</sup> E<sub>t</sub> = Thermal efficiency. See test procedure for detailed discussion.<sup>e</sup> E<sub>c</sub> = Combustion efficiency (100% less flue losses). See test procedure for detailed discussion.<sup>f</sup> E<sub>c</sub> = Combustion efficiency. Units must also include an IID, have jacket losses not exceeding 0.75% of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.<sup>g</sup> E<sub>t</sub> = Thermal efficiency. Units must also include an IID, have jacket losses not exceeding 0.75% of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.

Table 14-1F

**Boilers, Gas- and Oil-Fired, Minimum Efficiency Requirements**

Equipment Type <sup>f</sup>	Size Category	Sub-Category or Rating Condition	Minimum Efficiency <sup>b</sup>	Test Procedure
Boilers, Gas-Fired	< 300,000 Btu/h	Hot Water	80% AFUE	DOE 10 CFR Part 430
		Steam	75% AFUE	
	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h	Maximum Capacity <sup>b</sup>	75% E <sub>t</sub> and 80% E <sub>c</sub>	DOE 10 CFR Part 431
	> 2,500,000 Btu/h <sup>a</sup>	Hot Water	80% E <sub>c</sub>	
	> 2,500,000 Btu/h <sup>a</sup>	Steam	80% E <sub>c</sub>	
Boilers, Oil-Fired	< 300,000 Btu/h		80% AFUE	DOE 10 CFR Part 430
	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h	Maximum Capacity <sup>b</sup>	78% E <sub>t</sub> and 83% E <sub>c</sub>	DOE 10 CFR Part 431
	> 2,500,000 Btu/h <sup>a</sup>	Hot Water	83% E <sub>c</sub>	
	> 2,500,000 Btu/h <sup>a</sup>	Steam	83% E <sub>c</sub>	
Oil-Fired (Residual)	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h	Maximum Capacity <sup>b</sup>	78% E <sub>t</sub> and 83% E <sub>c</sub>	DOE 10 CFR Part 431
	> 2,500,000 Btu/h <sup>a</sup>	Hot Water	83% E <sub>c</sub>	



Equipment Type <sup>f</sup>	Size Category	Sub-Category or Rating Condition	Minimum Efficiency <sup>b</sup>	Test Procedure
	> 2,500,000 Btu/h <sup>a</sup>	Steam	83% E <sub>c</sub>	
<sup>a</sup> These requirements apply to boilers with rated input of 8,000,000 Btu/h or less that are not packaged boilers, and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers. <sup>b</sup> Minimum and maximum ratings as provided for and allowed by the unit's controls. E <sub>c</sub> = Combustion efficiency (100% less flue losses). See reference document for detailed information. E <sub>t</sub> = Thermal efficiency. See reference document for detailed information.				

**Table 14-1G**  
**Performance Requirements for Heat Rejection Equipment**

Equipment Type	Total System Heat Rejection Capacity at Rated Conditions	Sub-Category or Rating Condition	Minimum Efficiency <sup>b</sup>	Test Procedure <sup>c</sup>
Propeller or Axial Fan Cooling Towers	All	95°F (35°C) Entering Water 85°F (29°C) Leaving Water 75°F (24°C) wb Outdoor Air	≥ 38.2 gpm/hp	CTI ATC-105 and CTI STD-201
Centrifugal Fan Cooling Towers	All	95°F (35°C) Entering Water 85°F (29°C) Leaving Water 75°F (24°C) wb Outdoor Air	≥ 20.0 gpm/hp	CTI ATC-105 and CTI STD-201
Air Cooled Condensers	All	125°F (52°C) Condensing Temperature R22 Test Fluid 190°F (88°C) Entering Gas Temperature 15°F (8°C) Subcooling 95°F (35°C) Entering Drybulb	≥ 176,000 Btu/h•hp	ARI 460
<sup>a</sup> For purposes of this table, cooling tower performance is defined as the maximum flow rating of the tower divided by the fan nameplate rated motor power. <sup>b</sup> For purposes of this table air-cooled condenser performance is defined as the heat rejected from the refrigerant divided by the fan nameplate rated motor power. <sup>c</sup> Reserved.				

TABLE 14-2 RESERVED

TABLE 14-3 RESERVED

**TABLE 14-4**  
**Energy Efficient Electric Motors**  
**Minimum Nominal Full-Load Efficiency**

	Open Motors			Closed Motors		
Synchronous Speed (RPM)	3,600	1,800	1,200	3,600	1,800	1,200
HP	Efficiency	Efficiency	Efficiency	Efficiency	Efficiency	Efficiency
1.0	-	82.5	80.0	75.5	82.5	80.0
1.5	82.5	84.0	84.0	82.5	84.0	85.5
2.0	84.0	84.0	85.5	84.0	84.0	86.5
3.0	84.0	86.5	86.5	85.5	87.5	87.5
5.0	85.5	87.5	87.5	87.5	87.5	87.5
7.5	87.5	88.5	88.5	88.5	89.5	89.5
10.0	88.5	89.5	90.2	89.5	89.5	89.5
15.0	89.5	91.0	90.2	90.2	91.0	90.2
20.0	90.2	91.0	91.0	90.2	91.0	90.2
25.0	91.0	91.7	91.7	91.0	92.4	91.7
30.0	91.0	92.4	92.4	91.0	92.4	91.7
40.0	91.7	93.0	93.0	91.7	93.0	93.0
50.0	92.4	93.0	93.0	92.4	93.0	93.0
60.0	93.0	93.6	93.6	93.0	93.6	93.6
75.0	93.0	94.1	93.6	93.0	94.1	93.6

	Open Motors			Closed Motors		
Synchronous Speed (RPM)	3,600	1,800	1,200	3,600	1,800	1,200
HP	Efficiency	Efficiency	Efficiency	Efficiency	Efficiency	Efficiency
100.0	93.0	94.1	94.1	93.6	94.5	94.1
125.0	93.6	94.5	94.1	94.5	94.5	94.1
150.0	93.6	95.0	94.5	94.5	95.0	95.0
200.0	94.5	95.0	94.5	95.0	95.0	95.0

**TABLE 14-5**  
**Duct Insulation**

Duct Type	Duct Location	Insulation R-Value	Other Requirements
Supply, Return	Not within conditioned space: On exterior of building, on roof, in attic, in enclosed ceiling space, in walls, in garage, in crawl spaces	R-7	Approved weather proof barrier
Outside air intake	Within conditioned space	R-7	See Section 1414.2
Supply, Return, Outside air intake	Not within conditioned space: in concrete, in ground	R-5.3	
Supply with supply air temperature < 55°F or > 105°F	Within conditioned space	R-3.3	

Note: Requirements apply to the duct type listed, whether heated or mechanically cooled. Mechanically cooled ducts requiring insulation shall have a vapor retarder, with a perm rating not greater than 0.5 and all joints sealed.

**TABLE 14-6**  
**Minimum Pipe Insulation (inches)<sup>1</sup>**

Fluid Design Operating Temp. Range, °F	Insulation Conductivity		Nominal Pipe Diameter (in.)					
	Conductivity Range Btu•in. / (h • ft <sup>2</sup> • °F)	Mean Rating Temp. °F	Runouts <sup>2</sup> up to 2	1 and less	> 1 to 2	> 2 to 4	> 4 to 6	> 6
Heating systems (Steam, Steam Condensate[, ] and Hot water)			Nominal Insulation Thickness					
Above 350	0.32-0.34	250	1.5	2.5	2.5	3.0	3.5	3.5
251-350	0.29-0.31	200	1.5	2.0	2.5	2.5	3.5	3.5
201-250	0.27-0.30	150	1.0	1.5	1.5	2.0	2.0	3.5
141-200	0.25-0.29	125	0.5	1.5	1.5	1.5	1.5	1.5
105-140	0.24-0.28	100	0.5	1.0	1.0	1.0	1.5	1.5
Domestic and Service Hot Water Systems								
105 and Greater	0.24-0.28	100	0.5	1.0	1.0	1.5	1.5	1.5
Cooling Systems (Chilled Water, Brine[, ] and Refrigerant)								
40-55	0.23-0.27	75	0.5	0.5	0.75	1.0	1.0	1.0
Below 40	0.23-0.27	75	1.0	1.0	1.5	1.5	1.5	1.5

- Alternative Insulation Types. Insulation thicknesses in Table 14-6 are based on insulation with thermal conductivities within the range listed in Table 14-6 for each fluid operating temperature range, rated in accordance with ASTM C 335-84 at the mean temperature listed in the table. For insulation that has a conductivity outside the range shown in Table 14-6 for the applicable fluid operating temperature range at the mean rating temperature shown (when rounded to the nearest 0.01 Btu•in./ (h • ft<sup>2</sup> • °F)), the minimum thickness shall be determined in accordance with the following equation:

$$T = PR[(1 + t/PR)^{K/k} - 1]$$

Where

T = Minimum insulation thickness for material with conductivity K, inches.

PR = Pipe actual outside radius, inches.

t = Insulation thickness from Table 14-6, inches

K = conductivity of alternate material at the mean rating temperature indicated in Table 14-6 for the applicable fluid temperature range, Btu•in./ (h•ft<sup>2</sup>•°F)

k = the lower value of the conductivity range listed in Table 14-6 for the applicable fluid temperature range, Btu •in./ (h • ft<sup>2</sup>•°F)

- Runouts to individual terminal units not exceeding 12 ft. in length.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1454, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1454, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045, 02-01-112, § 51-11-1454, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-1454, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1454, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1454, filed 10/18/93, effective 4/1/94.]

**Reviser's note:** RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffectual changes not filed by the agency in this manner. The bracketed material in the above section does not appear to conform to the statutory requirement.

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

**CHAPTER 15**  
**LIGHTING, MOTORS AND TRANSFORMERS**

**WAC 51-11-1501 Scope.** Interior and exterior lighting, electric motors and transformers shall comply with the requirements of this chapter.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1501, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1501, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1510 General requirements.** Lighting and motors shall comply with Sections 1511 through 1514.

Lighting systems shall comply with one of the following paths:

- a. Prescriptive Standards:  
Interior Section 1521, or  
Exterior Section 1522.
- b. Component Performance:  
Interior Section 1531, or  
Exterior Section 1532.
- c. Systems Analysis. See Section 1141.4.

The compliance path selected for interior and exterior lighting need not be the same. However, interior and exterior lighting cannot be traded.

Transformers shall comply with Section 1540.

Figure 15A  
Lighting, Motor and Transformer Compliance Options

Section Number	Subject	Prescriptive Option	Lighting Power Allowance Option	Systems Analysis Option
1510	General Requirements	X	X	X
1511	Electric Motors	X	X	X
1512	Exempt Lighting	X	X	X
1513	Lighting Controls	X	X	X
1514	Exit Signs	X	X	X
1520	Prescriptive Lighting Option	X		
1521	Prescriptive Interior Lighting Requirements	X		
1522	Prescriptive Exterior Lighting Requirements	Sec. 1532		
1530	Lighting Power Allowance Option		X	
1531	Interior Lighting Power Allowance		X	
1532	Exterior Lighting Power Allowance		X	
1540	Transformers	X	X	X
RS-29	Systems Analysis			X

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1510, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1510, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1511 Electric motors.** All permanently wired polyphase motors of 1 hp or more, which are not part of an HVAC system, shall comply with Section 1437.

**EXCEPTIONS:**

1. Motors that are an integral part of specialized process equipment.
2. Where the motor is integral to a listed piece of equipment for which no complying motor has been approved.

[Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1511, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1512 Exempt lighting.**

1512.1 Exempt Spaces: The following rooms, spaces, and areas, are exempt from the lighting power requirements in Sections 1520 and 1530 but shall comply with all other requirements of this chapter.

1. Areas in which medical or dental tasks are performed.
2. High risk security areas or any area identified by building officials as requiring additional lighting.
3. Spaces designed for primary use by the visually impaired, hard of hearing (lip-reading) or by senior citizens.
4. Food preparation areas.
5. Electrical/mechanical equipment rooms.

6. Inspection and restoration areas in galleries and museums.
7. The sanctuary portion of a house of worship, defined as the space or room where the worship service takes place. Classrooms, meeting rooms, offices and multipurpose rooms that are part of the same facility are not exempt.

1512.2 Exempt Lighting Equipment: The following lighting equipment and tasks are exempt from the lighting requirements of Section 1520 and need not be included when calculating the installed lighting power under Section 1530 but shall comply with all other requirements of this chapter. All other lighting in areas that are not exempted by Section 1512.2, where exempt tasks and equipment are used, shall comply with all of the requirements of this chapter.

1. Special lighting needs for research.
2. Emergency lighting that is automatically OFF during normal building operation.
3. Lighting that is part of machines, equipment or furniture.
4. Lighting that is used solely for indoor plant growth during the hours of 10:00 p.m. to 6:00 a.m.
5. Lighting for theatrical productions, television broadcasting (including sports facilities), audio-visual pre-

sentations, and special effects lighting for stage areas and dance floors in entertainment facilities.

6. Lighting for art exhibits, nonretail displays, portable plug in display fixtures, and show case lighting.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1512, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1512, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1512, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1512, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1513 Lighting controls.** Lighting, including exempt lighting in Section 1512, shall comply with this section. Where occupancy sensors are cited, they shall have the features listed in Section 1513.6.1. Where automatic time switches are cited, they shall have the features listed in Section 1513.6.2.

**1513.1 Local Control and Accessibility:** Each space, enclosed by walls or ceiling-height partitions, shall be provided with lighting controls located within that space. The lighting controls, whether one or more, shall be capable of turning off all lights within the space. The controls shall be readily accessible, at the point of entry/exit, to personnel occupying or using the space.

**EXCEPTIONS:** The following lighting controls may be centralized in remote locations:

1. Lighting controls for spaces which must be used as a whole.
2. Automatic controls.
3. Controls requiring trained operators.
4. Controls for safety hazards and security.

**1513.2 Area Controls:** The maximum lighting power that may be controlled from a single switch or automatic control shall not exceed that which is provided by a twenty ampere circuit loaded to not more than eighty percent. A master control may be installed provided the individual switches retain their capability to function independently. Circuit breakers may not be used as the sole means of switching.

**EXCEPTIONS:**

1. Industrial or manufacturing process areas, as may be required for production.
2. Areas less than five percent of footprint for footprints over 100,000 square feet.

**1513.3 Daylight Zone Control:** All daylighted zones, as defined in Chapter 2, both under overhead glazing and adjacent to vertical glazing, shall be provided with individual controls, or daylight- or occupant-sensing automatic controls, which control the lights independent of general area lighting.

Contiguous daylight zones adjacent to vertical glazing are allowed to be controlled by a single controlling device provided that they do not include zones facing more than two adjacent cardinal orientations (i.e. north, east, south, west). Daylight zones under overhead glazing more than 15 feet from the perimeter shall be controlled separately from daylight zones adjacent to vertical glazing.

**EXCEPTION:** Daylight spaces enclosed by walls or ceiling height partitions and containing 2 or fewer light fixtures are not required to have a separate switch for general area lighting.

**1513.4 Display, Exhibition, and Specialty Lighting Controls:** All display, exhibition, or specialty lighting shall be controlled independently of general area lighting.

(2007 Ed.)

**1513.5 Automatic Shut-Off Controls, Exterior:** Lighting for all exterior applications shall have automatic controls capable of turning off exterior lighting when sufficient daylight is available or when the lighting is not required during nighttime hours. Lighting not designated for dusk-to-dawn operation shall be controlled by either:

- a. A combination of a photosensor and a time switch; or
- b. An astronomical time switch.

Lighting designated for dusk-to-dawn operation shall be controlled by an astronomical time switch or photosensor. All time switches shall be capable of retaining programming and the time setting during loss of power for a period of at least 10 hours.

**EXCEPTION:** Lighting for covered vehicle entrances or exits from buildings or parking structures where required for safety, security, or eye adaptation.

**1513.6 Automatic Shut-Off Controls, Interior:** Buildings greater than 5,000 sq. ft. and all school classrooms shall be equipped with separate automatic controls to shut off the lighting during unoccupied hours. Within these buildings, all office areas less than 300 ft<sup>2</sup> enclosed by walls or ceiling-height partitions, and all meeting and conference rooms, and all school classrooms, shall be equipped with occupancy sensors that comply with Section 1513.6.1. For other spaces, automatic controls may be an occupancy sensor, time switch, or other device capable of automatically shutting off lighting.

**EXCEPTIONS:**

1. Areas that must be continuously illuminated (e.g., 24-hour convenience stores), or illuminated in a manner requiring manual operation of the lighting.
2. Emergency lighting systems.
3. Switching for industrial or manufacturing process facilities as may be required for production.
4. Hospitals and laboratory spaces.
5. Areas in which medical or dental tasks are performed are exempt from the occupancy sensor requirement.

**1513.6.1 Occupancy Sensors:** Occupancy sensors shall be capable of automatically turning off all the lights in an area, no more than 30 minutes after the area has been vacated. Light fixtures controlled by occupancy sensors shall have a wall-mounted, manual switch capable of turning off lights when the space is occupied.

**EXCEPTION:** Occupancy sensors in stairwells are allowed to have two step lighting (high-light and low-light) provided the control fails in the high-light position.

**1513.6.2 Automatic Time Switches:** Automatic time switches shall have a minimum 7 day clock and be capable of being set for 7 different day types per week and incorporate an automatic holiday "shut-off" feature, which turns off all loads for at least 24 hours and then resumes normally scheduled operations. Automatic time switches shall also have program back-up capabilities, which prevent the loss of program and time settings for at least 10 hours, if power is interrupted.

Automatic time switches shall incorporate an over-ride switching device which:

- a. Is readily accessible;
- b. Is located so that a person using the device can see the lights or the areas controlled by the switch, or so that the area being illuminated is annunciated; and
- c. Is manually operated;
- d. Allows the lighting to remain on for no more than two hours when an over-ride is initiated; and

- e. Controls an area not exceeding 5,000 square feet or 5 percent of footprint for footprints over 100,000 square feet, whichever is greater.

**1513.7 Commissioning Requirements:** For lighting controls which include daylight or occupant sensing automatic controls, automatic shut-off controls, occupancy sensors, or automatic time switches, the lighting controls shall be tested to ensure that control devices, components, equipment and systems are calibrated, adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to ensure they operate in accordance with approved plans and specifications. A complete report of test procedures and results shall be prepared and filed with the owner. Drawing notes shall require commissioning in accordance with this paragraph.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1513, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1513, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1513, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1513, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1514 Exit signs.** Exit signs shall have an input power demand of 5 watts or less per sign.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1514, filed 12/19/06, effective 7/1/07.]

#### **WAC 51-11-1520 Prescriptive lighting option.**

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1520, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1521 Prescriptive interior lighting requirements.** Spaces for which the Unit Lighting Power Allowance in Table 15-1 is 0.8 watts per square foot or greater may use unlimited numbers of lighting fixtures and lighting energy, provided that the installed lighting fixtures comply with all four of the following criteria:

- a. One- or two-lamp (but not three- or more lamp);
- b. Luminaires have a reflector or louver assembly to direct the light (bare lamp strip or industrial fixtures do not comply with this section);
- c. Fitted with type T-1, T-2, T-4, T-5, T-8 or compact fluorescent lamps from 5 to 60 watts (but not T-10 or T-12 lamps); and
- d. Hard-wired fluorescent electronic dimming ballasts with photocell or programmable dimming control for all lamps in all zones (nondimming electronic ballasts and electronic ballasts that screw into medium base sockets do not comply with this section).

Track lighting is not allowed under this path.

#### **EXCEPTIONS:**

- 1. Up to a total of 5 percent of installed lighting fixtures may use any type of ballasted lamp and do not require dimming controls.
- 2. Clear safety lenses are allowed in food prep and serving areas and patient care areas in otherwise compliant fixtures.
- 3. LED lights.
- 4. Metal halide lighting which complies with all three of the following criteria:
  - i. Luminaires or lamps which have a reflector or louver assembly to direct the light;

- ii. Fixtures are fitted with ceramic metal halide lamps not exceeding 150 watts; and
- iii. Electronic ballasts.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1521, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1521, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1521, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1521, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-1522 Prescriptive exterior lighting requirements.** See section 1532.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1522, filed 10/18/93, effective 4/1/94.]

#### **WAC 51-11-1530 Lighting power allowance option.**

The installed lighting wattage shall not exceed the lighting power allowance. Lighting wattage includes lamp and ballast wattage.

Luminaire wattage incorporated into the installed interior lighting power shall be determined in accordance with the following criteria:

- a. The wattage of incandescent or tungsten-halogen luminaires with medium screw base sockets and not containing permanently installed ballasts shall be the maximum labeled wattage of the luminaire.
- b. The wattage of luminaires with permanently installed or remote ballasts or transformers shall be the operating input wattage of the maximum lamp/auxiliary combination based on values from the auxiliary manufacturer's literature or recognized testing laboratories or shall be the maximum labeled wattage of the luminaire.
- c. For line voltage track and plugin busway, designed to allow the addition and/or relocation of luminaires without altering the wiring of the system, the wattage shall be:
  - 1. The specified wattage of the luminaires included in the system with a minimum of 50 watts per lineal foot of track or actual luminaire wattage, whichever is greater, or
  - 2. The wattage limit of permanent current limiting device(s) on the system.
- d. The wattage of low-voltage lighting track, cable conductor, rail conductor, and other flexible lighting systems that allow the addition and/or relocation of luminaires without altering the wiring of the system shall be the specified wattage of the transformer supplying the system.
- e. The wattage of all other miscellaneous lighting equipment shall be the specified wattage of the lighting equipment.

No credit towards compliance with the lighting power allowances shall be given for the use of any controls, automatic or otherwise.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1530, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1530, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1530, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1530, filed 10/18/93, effective 4/1/94.]

#### **WAC 51-11-1531 Interior lighting power allowance.**

The interior lighting power allowance shall be calculated by multiplying the gross interior floor area, in square feet, by the appropriate unit lighting power allowance, in watts per

square foot, for the use as specified in Table 15-1. Accessory uses, including corridors, lobbies and toilet facilities shall be included with the primary use.

The lighting power allowance for each use shall be separately calculated and summed to obtain the interior lighting power allowance.

In cases where a lighting plan for only a portion of a building is submitted, the interior lighting power allowance shall be based on the gross interior floor area covered by the plan. Plans submitted for common areas only, including corridors, lobbies and toilet facilities shall use the lighting power allowance for common areas in Table 15-1.

When insufficient information is known about the specific use of the space, the allowance shall be based on the apparent intended use of the space.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1531, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1531, filed 10/18/93, effective 4/1/94.]

### WAC 51-11-1532 Exterior lighting power allowance.

All exterior building grounds luminaires that operate at greater than 100 watts shall contain lamps having a minimum efficacy of 60 lm/W unless the luminaire is controlled by a motion sensor or qualifies for one of the following exceptions.

The total exterior lighting power allowance for all exterior building applications is the sum of the individual lighting power densities permitted in Table 15-2 for these applications. Trade-offs are allowed only among exterior lighting applications listed in the Table 15-2 "Tradable Surfaces" section.

**EXCEPTION:** Lighting used for the following exterior applications is exempt when equipped with a control device independent of the control of the nonexempt lighting:

- a. Specialized signal, directional, and marker lighting associated with transportation.
- b. Lighting integral to signs.
- c. Lighting integral to equipment or instrumentation and installed by its manufacturer.
- d. Lighting for theatrical purposes, including performance, stage, film production, and video production.
- e. Lighting for athletic playing areas.
- f. Temporary lighting.
- g. Lighting for industrial production.
- h. Theme elements in theme/amusement parks.
- i. Lighting used to highlight features of public monuments.
- j. Group U Occupancy accessory to Group R-3 or R-4 Occupancy.

1540 Transformers. The minimum efficiency of a low voltage dry-type distribution transformer shall be the Class I Efficiency Levels for distribution transformers specified in Table 4-2 of the "Guide for Determining Energy Efficiency for Distribution Transformers" published by the National Electrical Manufacturers Association (NEMA TP-1-2002).

**TABLE 15-1**  
Unit Lighting Power Allowance (LPA)

Use <sup>1</sup>	LPA <sup>2</sup> (watts/sq. ft.)
Automotive facility	0.9
Convention center	1.2
Court house	1.2
Cafeterias, fast food establishments <sup>5</sup> , restaurants/bars <sup>5</sup>	1.3
Dormitory	1.0

(2007 Ed.)

Use <sup>1</sup>	LPA <sup>2</sup> (watts/sq. ft.)
Exercise center	1.0
Gymnasias <sup>9</sup> , assembly spaces <sup>9</sup>	1.0
Health care clinic	1.0
Hospital, nursing homes, and other Group I-1 and I-2 Occupancies	1.2
Hotel/motel	1.0
Hotel banquet/conference/exhibition hall <sup>3,4</sup>	2.0
Laboratory spaces (all spaces not classified "laboratory" shall meet office and other appropriate categories)	1.8
Laundries	1.2
Libraries <sup>5</sup>	1.3
Manufacturing facility	1.3
Museum	1.1
Office buildings, office/administrative areas in facilities of other use types (including but not limited to schools, hospitals, institutions, museums, banks, churches) <sup>5,7,11</sup>	1.0
Parking garages	0.2
Penitentiary and other Group I-3 Occupancies	1.0
Police and fire stations <sup>8</sup>	1.0
Post office	1.1
Retail <sup>10</sup> , retail banking, mall concourses, wholesale stores (pallet rack shelving)	1.5
School buildings (Group E Occupancy only), school classrooms, day care centers	1.2
Theater, motion picture	1.2
Theater, performing arts	1.6
Transportation	1.0
Warehouses <sup>11</sup> , storage areas	0.5
Workshop	1.4
<b>Plans Submitted for Common Areas Only<sup>7</sup></b>	
Main floor building lobbies <sup>3</sup> (except mall concourses)	1.2
All building common areas, corridors, toilet facilities and washrooms, elevator lobbies, including Group R-1 and R-2 Occupancies	0.8

### Footnotes for Table 15-1

- In cases in which a general use and a specific use are listed, the specific use shall apply. In cases in which a use is not mentioned specifically, the *Unit Power Allowance* shall be determined by the building official. This determination shall be based upon the most comparable use specified in the table. See Section 1512 for exempt areas.
- The watts per square foot may be increased, by two percent per foot of ceiling height above twenty feet, unless specifically directed otherwise by subsequent footnotes.
- Watts per square foot of room may be increased by two percent per foot of ceiling height above twelve feet.
- For all other spaces, such as seating and common areas, use the *Unit Light Power Allowance* for assembly.
- Watts per square foot of room may be increased by two percent per foot of ceiling height above nine feet.
- Reserved.
- For conference rooms and offices less than 150 ft<sup>2</sup> with full-height partitions, a *Unit Lighting Power Allowance* of 1.1 W/ft<sup>2</sup> may be used.
- Reserved.
- For indoor sport tournament courts with adjacent spectator seating over 5,000, the *Unit Lighting Power Allowance* for the court area is 2.6 watts per square foot.
- Display window illumination installed within 2 feet of the window, provided that the display window is separated from the retail space by walls or at least three-quarter-height partitions (transparent or opaque) and lighting

for free-standing display where the lighting moves with the display are exempt.

An additional 1.5 w/ft<sup>2</sup> of merchandise display luminaires are exempt provided that they comply with all three of the following:

(a) Located on ceiling-mounted track or directly on or recessed into the ceiling itself (not on the wall).

(b) Adjustable in both the horizontal and vertical axes (vertical axis only is acceptable for fluorescent and other fixtures with two points of track attachment).

(c) Fitted with LED, tungsten halogen, fluorescent, or high intensity discharge lamps.

This additional lighting power is allowed only if the lighting is actually installed.

11. Provided that a floor plan, indicating rack location and height, is submitted, the square footage for a warehouse may be defined, for computing the interior *Unit Lighting Power Allowance*, as the floor area not covered by racks plus the vertical face area (access side only) of the racks. The height allowance defined in footnote 2 applies only to the floor area not covered by racks.

**TABLE 15-2**  
Lighting Power Densities for Building Exteriors

<b>Tradable Surfaces</b> (Lighting power densities for uncovered parking areas, building grounds, building entrances and exits, canopies and overhangs and outdoor sales areas may be traded.)	<b>Uncovered Parking Areas</b>	
	Parking lots and drives	<b>0.15 W/ft<sup>2</sup></b>
	<b>Building Grounds</b>	
	Walkways less than 10 feet wide	<b>1.0 W/linear foot</b>
	Walkways 10 feet wide or greater	<b>0.2 W/ft<sup>2</sup></b>
	Plaza areas	
	Special feature areas	
	Stairways	<b>1.0 W/ft<sup>2</sup></b>
	<b>Building Entrances and Exits</b>	
	Main entries	<b>30 W/linear foot of door width</b>
	Other doors	<b>20 W/linear foot of door width</b>
	<b>Canopies and Overhangs</b>	
	Canopies (free standing and attached and overhangs)	<b>1.25 W/ft<sup>2</sup></b>
	<b>Outdoor Sales</b>	
	Open areas (including vehicle sales lots)	<b>0.5 W/ft<sup>2</sup></b>
	Street frontage for vehicle sales lots in addition to "open area" allowance	<b>20 W/linear foot</b>
<b>Nontradable Surfaces</b> (Lighting power density calculations for the following applications can be used only for the specific application and cannot be traded between surfaces or with other exterior lighting. The following allowances are in addition to any allowance otherwise permitted in the "tradable surfaces" section of this table.)	<b>Building facades</b>	<b>0.2 W/ft<sup>2</sup> for each illuminated wall or surface or 5.0 W/linear foot for each illuminated wall or surface length</b>
	<b>Automated teller machines and night depositories</b>	<b>270 W per location plus 90 W per additional ATM per location</b>
	<b>Entrances and gatehouse inspection stations at guarded facilities</b>	<b>1.25 W/ft<sup>2</sup> of uncovered area (covered areas are included in the "Canopies and Overhangs" section of "Tradable Surfaces")</b>
	<b>Loading areas for law enforcement, fire, ambulance and other emergency service vehicles</b>	<b>0.5 W/ft<sup>2</sup> of uncovered area (covered areas are included in the "Canopies and Overhangs" section of "Tradable Surfaces")</b>
	<b>Material handling and associated storage</b>	<b>0.5 W/ft<sup>2</sup></b>
	<b>Drive-up windows at fast food restaurants</b>	<b>400 W per drive-through</b>
	<b>Parking near 24-hour retail entrances</b>	<b>800 W per main entry</b>

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1532, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1532, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.020, 19.27A.045, 04-01-106, § 51-11-1532, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-1532, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-1532, filed 10/18/93, effective 4/1/94.]

**CHAPTER 16  
(RESERVED)**

**CHAPTER 17  
STANDARDS**

**Note:** For nonresidential standards, see chapter 7.

**CHAPTER 18  
(RESERVED)**

**CHAPTER 19  
(RESERVED)**

**CHAPTER 20  
DEFAULT HEAT-LOSS COEFFICIENTS**

**Note:** For nonresidential defaults, see chapter 10.

**REFERENCE STANDARD 29: NONRESIDENTIAL  
BUILDING DESIGN BY SYSTEMS ANALYSIS**

**WAC 51-11-99901 Section 1—Scope.**

**1.1 General:** This Standard establishes design criteria in terms of total energy consumption of a building, including all of its systems. General principles and requirements are outlined in Section 2. Specific modeling assumptions are listed in Section 3.

The building permit application for projects utilizing this Standard shall include in one submittal all building and mechanical drawings and all information necessary to verify that the design for the project corresponds with the annual energy analysis. If credit is proposed to be taken for lighting energy savings, then electrical drawings shall also be included with the building permit application.

Due to the various assumptions that are necessary, the results of the analysis shall not be construed as a guarantee of the actual energy performance of the project.

[Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-99901, filed 10/18/93, effective 4/1/94.]

**WAC 51-11-99902 Section 2—General principles and requirements.**

**2.1 Energy Analysis:** Compliance with this Standard will require an analysis of the annual energy usage, hereinafter called an annual energy analysis.

A building designed in accordance with this Standard will be deemed as complying with this Code, if

a. The calculated annual energy consumption is not greater than that of a corresponding "standard design," as defined below and in Section 3,

and;

b. Whose enclosure elements and energy-consuming systems comply with Sections 1310 through 1314, 1410 through 1416, 1440 through 1443, 1450 through 1454, 1510 through 1514 and 1540. Buildings shall only vary from those requirements in Sections 1330 through 1334, 1432 through

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1439 and 1530 through 1532 where those variations have been accurately and completely modeled. Where variations are not specifically analyzed, the building shall comply with these requirements.

For a proposed building design to be considered similar to a "standard design," it shall utilize the same energy source(s) for the same functions and have equal floor area and the same ratio of envelope area to floor area, environmental requirements, occupancy, climate data and usage operational schedule. Inputs to the energy analysis relating to occupancy and usage shall correspond to the expected occupancy and usage of the building.

Except as noted below, the systems identified, and, to the extent possible, the assumptions made in assigning energy inputs to each system, shall be the same for the standard design and the proposed design. When electrically driven heat pumps, other than multiple units connected to a common water loop, are employed to provide all or part of the heat for the proposed design, the standard design shall also, for the purposes of the analysis, assume that electrically driven heat pump, in conformance with Chapter 14 of the Code and having capacity at least as great as those used in the proposed design are employed.

**2.2 Design:** The standard design and the proposed design shall be designed on a common basis as specified herein:

a. The comparison shall be expressed as kBtu input per square foot of conditioned floor area per year at the building site. Buildings which use electricity as the only fuel source, comparisons may be expressed in kWh. When converting electricity in kWh to kBtu a multiplier of 3.413 kWh/kBtu shall be used.

b. If the proposed design results in an increase in consumption of one energy source and a decrease in another energy source, even though similar sources are used for similar purposes, the difference in each energy source shall be converted to equivalent energy units for purposes of comparing the total energy used.

**2.3 Analysis Procedure:** The analysis of the annual energy usage of the standard and the proposed building and system design shall meet the following criteria:

a. The building heating/cooling load calculation procedure used for annual energy consumption analysis shall be detailed to permit the evaluation of effect of factors specified in Section 2.4.

b. The calculation procedure used to simulate the operation of the building and its service systems through a full-year operating period shall be detailed to permit the evaluation of the effect of system design, climatic factors, operational characteristics and mechanical equipment on annual energy usage. Manufacturer's data or comparable field test data shall be used when available in the simulation of systems and equipment. The calculation procedure shall be based upon 8,760 hours of operation of the building and its service systems and shall utilize the design methods, specified in Standard RS-1 listed in Chapter 7 of the Code or in other programs approved by the building official.

**2.4 Calculation Procedure:** The calculation procedure shall cover the following items:



a. Design requirements—Design heating conditions and design cooling conditions as defined in Chapter 2 of the Code.

b. Climatic data—Coincident hourly data for temperatures, solar radiation, wind and humidity of typical days in the year representing seasonal variation.

c. Building data—Orientation, size, shape, mass, air and heat transfer characteristics.

d. Operational characteristics—Temperature, humidity, ventilation, illumination and control mode for occupied and unoccupied hours.

e. Mechanical equipment—Design capacity and part load profile.

f. Building loads—Internal heat generation, lighting, equipment and number of people during occupied and unoccupied periods.

**2.5 Documentation:** All analyses submitted shall be accompanied by an energy analysis comparison report. The report shall provide technical detail on the two building and system designs and on the data used in and resulting from the comparative analysis to verify that both the analysis and the designs meet the criteria of Section 1.

The calculation procedure for the standard design and the proposed design shall separately identify the calculated annual energy consumption for each different occupancy type, if possible, for each of the following end uses:

- a. Interior lighting;
- b. Parking lighting;
- c. Exterior lighting;
- d. Space heating;
- e. Space cooling;
- f. Interior ventilation/fans;
- g. Parking ventilation/fans;
- h. Exhaust fans;
- i. Service water heating;
- j. Elevators;
- k. Appliances.

Energy consumption of the following items shall be included but is not required to be separated out by each individual item.

- a. Office equipment;
- b. Refrigeration other than comfort cooling;
- c. Cooking; and
- d. Any other energy-consuming equipment.

The specifications of the proposed building project used in the analysis shall be as similar as is reasonably practical to those in the plans submitted for a building permit.

[Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-99902, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-99902, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-99902, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-99902, filed 10/18/93, effective 4/1/94.]

### **WAC 51-11-99903 Section 3—Specific modeling assumptions.**

The specific modeling assumptions consist of methods and assumptions for calculating the standard energy consumption for the standard building and the proposed energy consumption of the proposed design. In order to maintain consistency between the standard and the proposed design energy consumptions, the input assumptions in this section shall be used.

"Prescribed" assumptions shall be used without variation. "Default" assumptions shall be used unless the designer can demonstrate that a different assumption better characterizes the building's use over its expected life. Any modification of a default assumption shall be used in modeling both the standard building and the proposed design unless the designer demonstrates a clear cause to do otherwise.

**3.1 Orientation and Shape:** The standard building shall consist of the same number of stories and gross floor area for each story as the proposed design. Each floor shall be oriented exactly as the proposed design. The geometric form shall be the same as the proposed design.

**3.2 Internal Loads:** Internal loads shall be modeled as noted in the following parts of Section 3.2. The systems specified for calculating the standard energy consumption in Section 3.2 are intended only as constraints in calculating the consumption. They are not intended as requirements or recommendations for systems to be used in the proposed building or for the calculation of the proposed energy consumption.

**3.2.1 Occupancy:** Occupancy schedules shall be default assumptions. The same assumptions shall be made in computing proposed energy consumption as were used in calculating the standard energy consumption. Occupancy levels vary by building type and time of day. Table 3-1 establishes the density presented as ft<sup>2</sup>/person of conditioned floor area that will be used by each building type. Table 3-2 establishes the percentage of the people that are in the building by hours of the day for each building type.

**3.2.2 Lighting:** The interior and exterior lighting power allowance for calculating the standard energy consumption shall be determined from Sections 1531 and 1532. The lighting power used to calculate the proposed energy consumption shall be the actual lighting power of the proposed lighting design. Exempt lighting in the standard design shall be equal to the exempt lighting in the proposed design.

Lighting levels in buildings vary based on the type of uses within buildings, by area and by time of day. Table 3-2 contains the lighting energy profiles which establish the percentage of the lighting load that is switched ON in each prototype or reference building by hour of the day. These profiles are default assumptions and can be changed if required when calculating the standard energy consumption to provide, for example, a 12 hour rather than an 8 hour work day or to reflect the use of automatic lighting controls. The lighting schedules used in the standard and proposed designs shall be identical and shall reflect the type of controls to be installed in the proposed design. The controls in the proposed design shall comply with the requirements in Section 1513

and no credit shall be given for the use of any additional controls, automatic or otherwise.

**3.2.3 Receptacle:** Receptacle loads and profiles are default assumptions. The same assumptions shall be made in calculating proposed energy consumption as were used in calculating the standard energy consumption. Receptacle loads include all general service loads that are typical in a building. These loads should include additional process electrical usage but exclude HVAC primary or auxiliary electrical usage. Table 3-1 establishes the density in W/ft<sup>2</sup> to be used. The receptacle energy profiles shall be the same as the lighting energy profiles in Table 3-2. This profile establishes the percentage of the receptacle load that is switched ON by hour of the day and by building type.

### 3.3 Envelope

**3.3.1 Insulation and Glazing:** Glazing area and U-factor of the standard building envelope shall be determined by using the Target UA requirements of Equation 13-1 and U-factor values in Table 13-1 or 13-2. The glazing solar heat gain coefficient (SHGC) or shading coefficient of the standard building shall be the lesser of 0.65 and the SHGC required by Table 13-1 or 13-2 for the vertical or overhead glazing area for the appropriate wall type. The opaque area U-factors of the standard building shall be determined by using the Target UA requirements from Equation 13-1 including the appropriate mass for walls. The insulation characteristics and glazing area are prescribed assumptions for the standard building for calculating the standard energy consumption. In the calculation of the proposed energy consumption of the proposed design, the envelope characteristics of the proposed design shall be used. The standard design shall use the maximum glazing areas listed in Tables 13-1 or 13-2 for the appropriate use. The distribution of vertical glazing in the gross wall area of the standard design shall be equal to the distribution of vertical glazing in the proposed design or shall constitute an equal percentage of gross wall area on all sides of the standard building. The distribution of overhead glazing in the gross roof/ceiling area of the standard design shall be equal to the distribution of overhead glazing in the proposed design. The distribution of doors in the gross opaque wall area of the standard design shall be identical to the distribution of doors in the proposed design.

**3.3.2 Infiltration:** For standard and proposed buildings, infiltration assumptions shall be equal.

**3.3.3 Envelope and Ground Absorptivities:** For the standard building, absorptivity assumptions shall be default assumptions for computing the standard energy consumption and default assumptions for computing the proposed energy consumption. The solar absorptivity of opaque elements of the building envelope shall be assumed to be 70 percent. The solar absorptivity of ground surfaces shall be assumed to be 80 percent (20 percent reflectivity).

**3.3.4 Window Treatment:** No draperies or blinds shall be modeled for the standard or proposed building.

**3.3.5 Shading:** For standard building and the proposed design, shading by permanent structures and terrain shall be taken into account for computing energy consumption

whether or not these features are located on the building site. A permanent fixture is one that is likely to remain for the life of the proposed design. Credit may be taken for external shading devices that are part of the proposed design.

**3.4 HVAC Systems and Equipment:** For the standard building, the HVAC system used shall be the system type used in the proposed design. If the proposed HVAC system type does not comply with Sections 1432 through 1439, the standard design system shall comply in all respects with those sections.

**EXCEPTION:**

When approved by the building official, a prototype HVAC system may be used, if the proposed design system cannot be modified to comply with Sections 1422 and 1432 through 1439, as a standard design. Use of prototype HVAC systems shall only be permitted for the building types listed below. For mixed-use buildings, the floor space of each building type is allocated within the floor space of the standard building. The specifications and requirements for the HVAC systems of prototype buildings shall be those in Table 3-3.

- |                         |                         |
|-------------------------|-------------------------|
| 1. assembly             | 6. restaurant           |
| 2. health/institutional | 7. retail (mercantile)  |
| 3. hotel/motel          | 8. school (educational) |
| 4. light manufacturing  | 9. warehouse (storage)  |
| 5. office (business)    |                         |

**3.4.1 HVAC Zones:** HVAC zones for calculating the standard energy consumption and proposed energy consumption shall consist of at least four perimeter and one interior zone per floor, with at least one perimeter zone facing each orientation. The perimeter zones shall be fifteen feet in width or one-third the narrow dimension of the building when this dimension is between 30 and 45 feet inclusive or half the narrow dimension of the building when this dimension is less than thirty feet.

**EXCEPTIONS:**

1. Building types such as assembly or warehouse may be modeled as a single zone if there is only one space.
2. Thermally similar zones, such as those facing one orientation on different floors, may be grouped together for the purposes of either the standard or proposed building simulation.

**3.4.2 Process Equipment Sizing:** Process sensible and latent loads shall be equal in calculating both the standard energy consumption and the proposed energy consumption. The designer shall document the installation of process equipment and the size of process loads.

**3.4.3 HVAC Equipment Sizing:** The equipment shall be sized to include the capacity to meet the process loads. For calculating the proposed energy consumption, actual air flow rates and installed equipment size shall be used in the simulation. Equipment sizing in the simulation of the proposed design shall correspond to the equipment intended to be selected for the design and the designer shall not use equipment sized automatically by the simulation tool.

Equipment sizing for the standard design shall be based on the same as the proposed design or lesser sizing ratio of installed system capacity to the design load for heating and for cooling.

Chilled water systems for the standard building shall be modeled using a reciprocating chiller for systems with total cooling capacities less than 175 tons, and centrifugal chillers for systems with cooling capacities of 175 tons or greater. For

systems with cooling capacities of 600 tons or more the standard energy consumption shall be calculated using two centrifugal chillers, lead/lag controlled. Chilled water shall be assumed to be controlled at a constant 44 degree F temperature rise, from 44 degrees F to 56 degrees F, operating at 65 percent combined impeller and motor efficiency. Condenser water pumps shall be sized using a 10 degree F temperature rise, operating at 60 percent combined impeller and motor efficiency. The cooling tower shall be an open circuit, centrifugal blower type sized for the larger of 85 degrees F leaving water temperature or 10 degrees F approach to design wet-bulb temperature. The tower shall be controlled to provide a 65 degrees F leaving water temperature whenever weather conditions permit, floating up to design leaving water temperature at design conditions.

**3.4.4 Fans:** The power of the combined fan system per air volume at design conditions (w/cfm) of the proposed design shall be equal to that of the standard design.

Variable air volume fan systems in the standard building shall be variable speed.

**3.5 Service Water Heating:** The service water heating loads for prototype buildings are defined in terms of Btu/person-hour in Table 3-1. The values in the table refer to energy content of the heated water. The service water heating loads from Table 3-1 are default for all buildings. The same service-water-heating load assumptions shall be made in calculating proposed energy consumption as were used in calculating the standard energy consumption. The service water heating system for the standard building shall be modeled as closely as possible as if it were designed in accordance with RS-11 and meeting all the requirements of Sections 1440 through 1443.

### 3.6 Controls

**3.6.1:** All occupied conditioned spaces in standard and proposed design buildings in all climates shall be simulated as being both heated and cooled.

EXCEPTIONS:

1. If a building or portion of a building is to be provided with only heating or cooling, both the standard building and the proposed design shall be simulated using the same assumptions.
2. If warehouses are not intended to be mechanically cooled, both the standard and proposed energy consumption shall be modeled assuming no mechanical cooling.

**3.6.2:** Space temperature controls for the standard building, shall be set at 70 degrees F for space heating and 75 degrees F for space cooling, with a deadband in accordance with Section 1412.2. The system shall be OFF during off-hours according to the appropriate schedule in Table 3-2, except that the heating system shall cycle ON if any space should drop below the night setback setting 55 degrees F. There shall be no similar setpoint during the cooling season. Lesser dead-band ranges may be used in calculating the proposed energy consumption.

EXCEPTIONS:

1. Setback shall not be modeled in determining either the standard or proposed energy consumption if setback is not realistic for the proposed design such as a facility being operated 24 hours/day. For instance, health facilities need not have night setback during the heating season.
2. If deadband controls are not to be installed, the proposed energy consumption shall be calculated with both heating and cooling thermostat setpoints set to

the same value between 70 degrees F and 75 degrees F inclusive, assumed to be constant for the year.

**3.6.3:** When providing for outdoor air ventilation when calculating the standard energy consumption, controls shall be assumed to close the outside air intake to reduce the flow of outside air to 0.0 cfm during "setback" and "unoccupied" periods. Ventilation using inside air may still be required to maintain scheduled setback temperature. Outside air ventilation, during occupied periods, shall be as required by the Washington State Ventilation and Indoor Air Quality Code chapter 51-13 WAC.

**3.6.4:** If humidification is to be used in the proposed design, the same level of humidification and system type shall be used in the standard building.

**TABLE 3-1**  
**Acceptable Occupancy Densities, Receptacle Power Densities and Service Hot Water Consumption<sup>1</sup>**

Building Type	Occupancy Density <sup>2</sup> Sq. Ft./Person (Btu/h•ft <sup>2</sup> )	Receptacle Power Density <sup>3</sup> Watts/Sq. Ft. (Btu/h•ft <sup>2</sup> )	Service Hot Water Quantities <sup>4</sup> Btu/h•person
Assembly	50 (4.60)	0.25 (0.85)	215
Health/Institutional	200 (1.15)	1.00 (3.41)	135
Hotel/Motel	250 (0.92)	0.25 (0.85)	1,110
Light Manufacturing	750 (0.31)	0.20 (0.68)	225
Office	275 (0.84)	0.75 (2.56)	175
Parking Garage	N.A.	N.A.	N.A.
Restaurant	100 (2.30)	0.10 (0.34)	390
Retail	300 (0.77)	0.25 (0.85)	135
School	75 (3.07)	0.50 (1.71)	215
Warehouse	15,000 (0.02)	0.10 (0.34)	225

1. The occupancy densities, receptacle power densities and service hot water consumption values are from ASHRAE Standard 90.1-1989 and addenda.
2. Values are in square feet of conditioned floor area per person. Heat generation in Btu per person per hour is 230 sensible and 190 latent. Figures in parentheses are equivalent Btu per hour per square foot.
3. Values are in Watts per square foot of conditioned floor area. Figures in parentheses are equivalent Btu per hour per square foot. These values are the minimum acceptable. If other process loads are not input (such as for computers, cooking, refrigeration, etc.), it is recommended that receptacle power densities be increased until total process energy consumption is equivalent to 25% of the total.
4. Values are in Btu per person per hour.

TABLE 3-2A  
Assembly Occupancy<sup>1</sup>

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	0	0	0	5	5	5	off	off	off	0	0	0	0	0	0
2 (1-2am)	0	0	0	5	5	5	off	off	off	0	0	0	0	0	0
3 (2-3am)	0	0	0	5	5	5	off	off	off	0	0	0	0	0	0
4 (3-4am)	0	0	0	5	5	5	off	off	off	0	0	0	0	0	0
5 (4-5am)	0	0	0	5	5	5	off	off	off	0	0	0	0	0	0
6 (5-6am)	0	0	0	5	5	5	on	off	off	0	0	0	0	0	0
7 (6-7am)	0	0	0	40	5	5	on	on	on	0	0	0	0	0	0
8 (7-8am)	0	0	0	40	30	30	on	on	on	0	0	0	0	0	0
9 (8-9am)	20	20	10	40	30	30	on	on	on	0	0	0	0	0	0
10 (9-10am)	20	20	10	75	50	30	on	on	on	5	5	5	0	0	0
11 (10-11am)	20	20	10	75	50	30	on	on	on	5	5	5	0	0	0
12 (11-12pm)	80	60	10	75	50	30	on	on	on	35	20	10	0	0	0
13 (12-1pm)	80	60	10	75	50	65	on	on	on	5	0	0	0	0	0
14 (1-2pm)	80	60	70	75	50	65	on	on	on	5	0	0	0	0	0
15 (2-3pm)	80	60	70	75	50	65	on	on	on	5	0	0	0	0	0
16 (3-4pm)	80	60	70	75	50	65	on	on	on	5	0	0	0	0	0
17 (4-5pm)	80	60	70	75	50	65	on	on	on	5	0	0	0	0	0
18 (5-6pm)	80	60	70	75	50	65	on	on	on	0	0	0	0	0	0
19 (6-7pm)	20	60	70	75	50	65	on	on	on	0	0	0	0	0	0
20 (7-8pm)	20	60	70	75	50	65	on	on	on	0	65	65	0	0	0
21 (8-9pm)	20	60	70	75	50	65	on	on	on	0	30	30	0	0	0
22 (9-10pm)	20	80	70	75	50	65	on	on	on	0	0	0	0	0	0
23 (10-11pm)	10	10	20	25	50	5	on	on	on	0	0	0	0	0	0
24 (11-12am)	0	0	0	5	5	5	off	off	off	0	0	0	0	0	0
Total/Day	710	750	700	1155	800	845	1800	1700	1700	70	125	115	0	0	0
Total/Week		50.50	hours		74.20	hours		124	hours		5.9	hours		0	hours
Total/Year		2633	hours		3869	hours		6465	hours		308	hours		0	hours

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

TABLE 3-2B  
Health Occupancy<sup>1</sup>

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
2 (1-2am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
3 (2-3am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
4 (3-4am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
5 (4-5am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
6 (5-6am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
7 (6-7am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
8 (7-8am)	10	10	0	50	20	5	on	on	on	17	1	1	2	2	0
9 (8-9am)	50	30	5	90	40	10	on	on	on	58	20	1	75	46	2
10 (9-10am)	80	40	5	90	40	10	on	on	on	66	28	1	100	70	2
11 (10-11am)	80	40	5	90	40	10	on	on	on	78	30	1	100	70	2
12 (11-12pm)	80	40	5	90	40	10	on	on	on	82	30	1	100	70	2
13 (12-1pm)	80	40	5	90	40	10	on	on	on	71	24	1	75	51	2
14 (1-2pm)	80	40	5	90	40	10	on	on	on	82	24	1	100	51	2
15 (2-3pm)	80	40	5	90	40	10	on	on	on	78	23	1	100	51	2
16 (3-4pm)	80	40	5	90	40	10	on	on	on	74	23	1	100	51	2
17 (4-5pm)	80	40	0	30	40	5	on	on	on	63	23	1	100	51	0
18 (5-6pm)	50	10	0	30	40	5	on	on	on	41	10	1	100	25	0
19 (6-7pm)	30	10	0	30	10	5	on	on	on	18	1	1	52	2	0
20 (7-8pm)	30	0	0	30	10	5	on	on	on	18	1	1	52	0	0
21 (8-9pm)	20	0	0	30	10	5	on	on	on	18	1	1	52	0	0

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
22 (9-10pm)	20	0	0	30	10	5	on	on	on	10	1	1	28	0	0
23 (10-11pm)	0	0	0	30	10	5	on	on	on	1	1	1	0	0	0
24 (11-12am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
Total/Day	850	380	40	1060	550	160	2400	2400	2400	783	249	24	1136	540	16
Total/Week		46.70	hours		60.10	hours		168	hours		41.88	hours		62.36	hours
Total/Year		2435	hours		3134	hours		8760	hours		2148	hours		3251	hours

Wk = Weekday

- Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

**TABLE 3-2C**  
**Hotel/Motel Occupancy<sup>1</sup>**

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	90	90	70	20	20	30	on	on	on	20	20	25	40	44	55
2 (1-2am)	90	90	70	15	20	30	on	on	on	15	15	20	33	35	55
3 (2-3am)	90	90	70	10	10	20	on	on	on	15	15	20	33	35	43
4 (3-4am)	90	90	70	10	10	20	on	on	on	15	15	20	33	35	43
5 (4-5am)	90	90	70	10	10	20	on	on	on	20	20	20	33	35	43
6 (5-6am)	90	90	70	20	10	20	on	on	on	25	25	30	33	35	43
7 (6-7am)	70	70	70	40	30	30	on	on	on	50	40	50	42	40	52
8 (7-8am)	40	50	70	50	30	40	on	on	on	60	50	50	42	32	52
9 (8-9am)	40	50	50	40	40	40	on	on	on	55	50	50	52	45	65
10 (9-10am)	20	30	50	40	40	30	on	on	on	45	50	55	52	45	65
11 (10-11am)	20	30	50	25	30	30	on	on	on	40	45	50	40	42	53
12 (11-12pm)	20	30	30	25	25	30	on	on	on	45	50	50	51	60	60
13 (12-1pm)	20	30	30	25	25	30	on	on	on	40	50	40	51	65	53
14 (1-2pm)	20	30	20	25	25	20	on	on	on	35	45	40	51	65	51
15 (2-3pm)	20	30	20	25	25	20	on	on	on	30	40	30	51	65	50
16 (3-4pm)	30	30	20	25	25	20	on	on	on	30	40	30	51	65	44
17 (4-5pm)	50	30	30	25	25	20	on	on	on	30	35	30	63	65	64
18 (5-6pm)	50	50	40	25	25	20	on	on	on	40	40	40	80	75	62
19 (6-7pm)	50	60	40	60	60	50	on	on	on	55	55	50	86	80	65
20 (7-8pm)	70	60	60	80	70	70	on	on	on	60	55	50	70	80	63
21 (8-9pm)	70	60	60	90	70	80	on	on	on	50	50	40	70	75	63
22 (9-10pm)	80	70	80	80	70	60	on	on	on	55	55	50	70	75	63
23 (10-11pm)	90	70	80	60	60	50	on	on	on	45	40	40	45	55	40
24 (11-12am)	90	70	80	30	30	30	on	on	on	25	30	20	45	55	40
Total/Day	1390	1390	1300	855	785	810	2400	2400	2400	915	930	900	1217	1303	1287
Total/Week		96.40	hours		58.70	hours		168.0	hours		64.05	hours		86.75	hours
Total/Year		5026	hours		3061	hours		8760	hours		3340	hours		4523	hours

Wk = Weekday

- Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

**TABLE 3-2D**  
**Light Manufacturing Occupancy<sup>1</sup>**

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
2 (1-2am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
3 (2-3am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
4 (3-4am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
5 (4-5am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
6 (5-6am)	0	0	0	10	5	5	off	off	off	8	8	7	0	0	0
7 (6-7am)	10	10	5	10	10	5	on	on	off	7	7	4	0	0	0
8 (7-8am)	20	10	5	30	10	5	on	on	off	19	11	4	35	16	0
9 (8-9am)	95	30	5	90	30	5	on	on	off	35	15	4	69	14	0
10 (9-10am)	95	30	5	90	30	5	on	on	off	38	21	4	43	21	0
11 (10-11am)	95	30	5	90	30	5	on	on	off	39	19	4	37	18	0
12 (11-12pm)	95	30	5	90	30	5	on	on	off	47	23	6	43	25	0
13 (12-1pm)	50	10	5	80	15	5	on	on	off	57	20	6	58	21	0
14 (1-2pm)	95	10	5	90	15	5	on	on	off	54	19	9	48	13	0
15 (2-3pm)	95	10	5	90	15	5	on	on	off	34	15	6	37	8	0
16 (3-4pm)	95	10	5	90	15	5	on	on	off	33	12	4	37	4	0
17 (4-5pm)	95	10	5	90	15	5	on	on	off	44	14	4	46	5	0
18 (5-6pm)	30	5	5	50	5	5	on	on	off	26	7	4	62	6	0
19 (6-7pm)	10	5	0	30	5	5	on	off	off	21	7	4	20	0	0
20 (7-8pm)	10	0	0	30	5	5	on	off	off	15	7	4	12	0	0
21 (8-9pm)	10	0	0	20	5	5	on	off	off	17	7	4	4	0	0
22 (9-10pm)	10	0	0	20	5	5	on	off	off	8	9	7	4	0	0
23 (10-11pm)	5	0	0	10	5	5	off	off	off	5	5	4	0	0	0
24 (11-12am)	5	0	0	5	5	5	off	off	off	5	5	4	0	0	0
Total/Day	920	200	60	1040	280	120	1600	1200	0	537	256	113	555	151	0
Total/Week		48.60	hours		56.00	hours		92.00	hours		30.54	hours		29.26	hours
Total/Year		2534	hours		2920	hours		4797	hours		1592	hours		1526	hours

Wk = Weekday

- Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

TABLE 3-2E  
Office Occupancy<sup>1</sup>

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
2 (1-2am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
3 (2-3am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
4 (3-4am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
5 (4-5am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
6 (5-6am)	0	0	0	10	5	5	off	off	off	8	8	7	0	0	0
7 (6-7am)	10	10	5	10	10	5	on	on	off	7	7	4	0	0	0
8 (7-8am)	20	10	5	30	10	5	on	on	off	19	11	4	35	16	0
9 (8-9am)	95	30	5	90	30	5	on	on	off	35	15	4	69	14	0
10 (9-10am)	95	30	5	90	30	5	on	on	off	38	21	4	43	21	0
11 (10-11am)	95	30	5	90	30	5	on	on	off	39	19	4	37	18	0
12 (11-12pm)	95	30	5	90	30	5	on	on	off	47	23	6	43	25	0
13 (12-1pm)	50	10	5	80	15	5	on	on	off	57	20	6	58	21	0
14 (1-2pm)	95	10	5	90	15	5	on	on	off	54	19	9	48	13	0
15 (2-3pm)	95	10	5	90	15	5	on	on	off	34	15	6	37	8	0
16 (3-4pm)	95	10	5	90	15	5	on	on	off	33	12	4	37	4	0
17 (4-5pm)	95	10	5	90	15	5	on	on	off	44	14	4	46	5	0
18 (5-6pm)	30	5	5	50	5	5	on	on	off	26	7	4	62	6	0
19 (6-7pm)	10	5	0	30	5	5	on	off	off	21	7	4	20	0	0
20 (7-8pm)	10	0	0	30	5	5	on	off	off	15	7	4	12	0	0
21 (8-9pm)	10	0	0	20	5	5	on	off	off	17	7	4	4	0	0
22 (9-10pm)	10	0	0	20	5	5	on	off	off	8	9	7	4	0	0
23 (10-11pm)	5	0	0	10	5	5	off	off	off	5	5	4	0	0	0
24 (11-12am)	5	0	0	5	5	5	off	off	off	5	5	4	0	0	0

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
Total/Day	920	200	60	1040	280	120	1600	1200	0	537	256	113	555	151	0
Total/Week	48.60 hours			56.00 hours			92.00 hours			30.54 hours			29.26 hours		
Total/Year	2534 hours			2920 hours			4797 hours			1592 hours			1526 hours		

Wk = Weekday

- Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

**TABLE 3-2F**  
**Parking Garage Occupancy<sup>1</sup>**

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	N/A			100	100	100	Based on likely use			N/A			Included with other occupancies		
2 (1-2am)				100	100	100									
3 (2-3am)				100	100	100									
4 (3-4am)				100	100	100									
5 (4-5am)				100	100	100									
6 (5-6am)				100	100	100									
7 (6-7am)				100	100	100									
8 (7-8am)				100	100	100									
9 (8-9am)				100	100	100									
10 (9-10am)				100	100	100									
11 (10-11am)				100	100	100									
12 (11-12pm)				100	100	100									
13 (12-1pm)				100	100	100									
14 (1-2pm)				100	100	100									
15 (2-3pm)				100	100	100									
16 (3-4pm)				100	100	100									
17 (4-5pm)				100	100	100									
18 (5-6pm)				100	100	100									
19 (6-7pm)				100	100	100									
20 (7-8pm)				100	100	100									
21 (8-9pm)				100	100	100									
22 (9-10pm)				100	100	100									
23 (10-11pm)				100	100	100									
24 (11-12am)				100	100	100									
Total/Day				2400	2400	2400									
Total/Week				168 hours											
Total/Year				8760 hours											

Wk = Weekday

- Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

**TABLE 3-2G**  
**Restaurant Occupancy<sup>1</sup>**

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	15	30	20	15	20	20	on	on	on	20	20	25	0	0	0
2 (1-2am)	15	25	20	15	15	15	on	on	on	15	15	20	0	0	0
3 (2-3am)	5	5	5	15	15	15	on	on	on	15	15	20	0	0	0
4 (3-4am)	0	0	0	15	15	15	off	off	off	0	0	0	0	0	0
5 (4-5am)	0	0	0	15	15	15	off	off	off	0	0	0	0	0	0
6 (5-6am)	0	0	0	20	15	15	off	off	off	0	0	0	0	0	0
7 (6-7am)	0	0	0	40	30	30	off	off	off	0	0	0	0	0	0

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
8 (7-8am)	5	0	0	40	30	30	on	off	off	60	0	0	0	0	0
9 (8-9am)	5	0	0	60	60	50	on	off	off	55	0	0	0	0	0
10 (9-10am)	5	5	0	60	60	50	on	on	off	45	50	0	0	0	0
11 (10-11am)	20	20	10	90	80	70	on	on	on	40	45	50	0	0	0
12 (11-12pm)	50	45	20	90	80	70	on	on	on	45	50	50	0	0	0
13 (12-1pm)	80	50	25	90	80	70	on	on	on	40	50	40	0	0	0
14 (1-2pm)	70	50	25	90	80	70	on	on	on	35	45	40	0	0	0
15 (2-3pm)	40	35	15	90	80	70	on	on	on	30	40	30	0	0	0
16 (3-4pm)	20	30	20	90	80	70	on	on	on	30	40	30	0	0	0
17 (4-5pm)	25	30	25	90	80	60	on	on	on	30	35	30	0	0	0
18 (5-6pm)	50	30	35	90	90	60	on	on	on	40	40	40	0	0	0
19 (6-7pm)	80	70	55	90	90	60	on	on	on	55	55	50	0	0	0
20 (7-8pm)	80	90	65	90	90	60	on	on	on	60	55	50	0	0	0
21 (8-9pm)	80	70	70	90	90	60	on	on	on	50	50	40	0	0	0
22 (9-10pm)	50	65	35	90	90	60	on	on	on	55	55	50	0	0	0
23 (10-11pm)	35	55	20	50	50	50	on	on	on	45	40	40	0	0	0
24 (11-12am)	20	35	20	30	30	30	on	on	on	25	30	20	0	0	0
Total/Day	750	740	485	1455	1365	1115	2000	1800	1700	790	730	625	0	0	0
Total/Week		49.75	hours		97.55	hours		135	hours		53.05	hours		0	hours
Total/Year		2594	hours		5086	hours		7039	hours		2766	hours		0	hours

Wk = Weekday

- Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

**TABLE 3-2H**  
**Retail Occupancy<sup>1</sup>**

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	0	0	0	5	5	5	off	off	off	4	11	7	0	0	0
2 (1-2am)	0	0	0	5	5	5	off	off	off	5	10	7	0	0	0
3 (2-3am)	0	0	0	5	5	5	off	off	off	5	8	7	0	0	0
4 (3-4am)	0	0	0	5	5	5	off	off	off	4	6	6	0	0	0
5 (4-5am)	0	0	0	5	5	5	off	off	off	4	6	6	0	0	0
6 (5-6am)	0	0	0	5	5	5	off	off	off	4	6	6	0	0	0
7 (6-7am)	0	0	0	5	5	5	on	on	off	4	7	7	0	0	0
8 (7-8am)	10	10	0	20	10	5	on	on	off	15	20	10	12	9	0
9 (8-9am)	20	20	0	50	30	10	on	on	on	23	24	12	22	21	0
10 (9-10am)	50	50	10	90	60	10	on	on	on	32	27	14	64	56	11
11 (10-11am)	50	60	20	90	90	40	on	on	on	41	42	29	74	66	13
12 (11-12pm)	70	80	20	90	90	40	on	on	on	57	54	31	68	68	35
13 (12-1pm)	70	80	40	90	90	60	on	on	on	62	59	36	68	68	37
14 (1-2pm)	70	80	40	90	90	60	on	on	on	61	60	36	71	69	37
15 (2-3pm)	70	80	40	90	90	60	on	on	on	50	49	34	72	70	39
16 (3-4pm)	80	80	40	90	90	60	on	on	on	45	48	35	72	69	41
17 (4-5pm)	70	80	40	90	90	60	on	on	on	46	47	37	73	66	38
18 (5-6pm)	50	60	20	90	90	40	on	on	off	47	46	34	68	58	34
19 (6-7pm)	50	20	10	60	50	20	on	on	off	42	44	25	68	47	3
20 (7-8pm)	30	20	0	60	30	5	on	on	off	34	36	27	58	43	0
21 (8-9pm)	30	20	0	50	30	5	on	on	off	33	29	21	54	43	0
22 (9-10pm)	0	10	0	20	10	5	off	on	off	23	22	16	0	8	0
23 (10-11pm)	0	0	0	5	5	5	off	off	off	13	16	10	0	0	0
24 (11-12am)	0	0	0	5	5	5	off	off	off	8	13	6	0	0	0
Total/Day	720	750	280	1115	985	525	1500	1600	900	662	690	459	844	761	288
Total/Week		46.30	hours		70.85	hours		100	hours		44.59	hours		52.69	hours
Total/Year		2414	hours		3694	hours		5214	hours		2325	hours		2747	hours

Wk = Weekday

- Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.



**TABLE 3-2I**  
**School Occupancy<sup>1</sup>**

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
2 (1-2am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
3 (2-3am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
4 (3-4am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
5 (4-5am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
6 (5-6am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
7 (6-7am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
8 (7-8am)	5	0	0	30	5	5	on	off	off	10	3	3	0	0	0
9 (8-9am)	75	10	0	85	15	5	on	on	off	34	3	5	30	0	0
10 (9-10am)	90	10	0	95	15	5	on	on	off	60	5	5	30	0	0
11 (10-11am)	90	10	0	95	15	5	on	on	off	63	5	5	30	0	0
12 (11-12pm)	80	10	0	95	15	5	on	on	off	72	5	5	30	0	0
13 (12-1pm)	80	10	0	80	15	5	on	on	off	79	5	5	30	0	0
14 (1-2pm)	80	0	0	80	5	5	on	off	off	83	3	5	30	0	0
15 (2-3pm)	80	0	0	80	5	5	on	off	off	61	3	3	30	0	0
16 (3-4pm)	45	0	0	70	5	5	on	off	off	65	3	3	15	0	0
17 (4-5pm)	15	0	0	50	5	5	on	off	off	10	3	3	0	0	0
18 (5-6pm)	5	0	0	50	5	5	on	off	off	10	3	3	0	0	0
19 (6-7pm)	15	0	0	35	5	5	on	off	off	19	3	3	0	0	0
20 (7-8pm)	20	0	0	35	5	5	on	off	off	25	3	3	0	0	0
21 (8-9pm)	20	0	0	35	5	5	on	off	off	22	3	3	0	0	0
22 (9-10pm)	10	0	0	30	5	5	on	off	off	22	3	3	0	0	0
23 (10-11pm)	0	0	0	5	5	5	off	off	off	12	3	3	0	0	0
24 (11-12am)	0	0	0	5	5	5	off	off	off	9	3	3	0	0	0
Total/Day	710	50	0	990	170	120	1500	500	0	691	80	84	285	0	0
Total/Week		36.00	hours		52.40	hours		80.00	hours		36.19	hours		14.25	hours
Total/Year		1877	hours		2732	hours		4171	hours		1887	hours		743	hours

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

**TABLE 3-2J**  
**Warehouse Occupancy<sup>1</sup>**

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	0	0	0	5	5	5	off	off	off	2	2	2	0	0	0
2 (1-2am)	0	0	0	5	5	5	off	off	off	2	2	2	0	0	0
3 (2-3am)	0	0	0	5	5	5	off	off	off	2	2	2	0	0	0
4 (3-4am)	0	0	0	5	5	5	off	off	off	2	2	2	0	0	0
5 (4-5am)	0	0	0	5	5	5	off	off	off	5	2	2	0	0	0
6 (5-6am)	0	0	0	5	5	5	off	off	off	7	2	2	0	0	0
7 (6-7am)	0	0	0	5	5	5	off	off	off	7	2	2	0	0	0
8 (7-8am)	15	0	0	40	5	5	on	off	off	10	2	2	0	0	0
9 (8-9am)	70	20	0	70	8	5	on	on	off	30	6	2	0	0	0
10 (9-10am)	90	20	0	90	24	5	on	on	off	36	12	2	0	0	0
11 (10-11am)	90	20	0	90	24	5	on	on	off	36	12	2	30	0	0
12 (11-12pm)	90	20	0	90	24	5	on	on	off	46	17	2	0	0	0
13 (12-1pm)	50	10	0	80	5	5	on	on	off	57	4	4	0	0	0
14 (1-2pm)	85	10	0	90	5	5	on	on	off	43	4	4	0	0	0
15 (2-3pm)	85	10	0	90	5	5	on	on	off	38	2	2	0	0	0
16 (3-4pm)	85	10	0	90	5	5	on	on	off	40	2	2	40	0	0
17 (4-5pm)	20	0	0	90	5	5	on	off	off	30	2	2	0	0	0
18 (5-6pm)	0	0	0	30	5	5	off	off	off	18	2	2	0	0	0
19 (6-7pm)	0	0	0	5	5	5	off	off	off	3	2	2	0	0	0
20 (7-8pm)	0	0	0	5	5	5	off	off	off	3	2	2	0	0	0
21 (8-9pm)	0	0	0	5	5	5	off	off	off	3	2	2	0	0	0
22 (9-10pm)	0	0	0	5	5	5	off	off	off	3	2	2	0	0	0
23 (10-11pm)	0	0	0	5	5	5	off	off	off	3	2	2	0	0	0

Hour of Day (time)	Schedule for Occupancy			Schedule for Lighting Receptacle			Schedule for HVAC System			Schedule for Service Hot Water			Schedule for Elevator		
	Percent of Maximum Load			Percent of Maximum Load						Percent of Maximum Load			Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
24 (11-12am)	0	0	0	5	5	5	off	off	off	3	2	2	0	0	0
Total/Day	680	120	0	915	180	120	1000	800	0	429	91	52	70	0	0
Total/Week		35.20	hours		48.75	hours		58.00	hours		22.88	hours		3.50	hours
Total/Year		1835	hours		2542	hours		3024	hours		1193	hours		182	hours

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

**TABLE 3-3**  
**HVAC Systems of Prototype Buildings<sup>3</sup>**

Use	System #	Remarks
1. Assembly		
a. Churches (any size)	1	
b. ≤ 50,000 ft <sup>2</sup> or ≤ 3 floors	1 or 3	Note 2
c. > 50,000 ft <sup>2</sup> or > 3 floors	3	
2. Health		
a. Nursing Home (any size)	2	
b. ≤ 15,000 ft <sup>2</sup>	1	
c. > 15,000 ft <sup>2</sup> and ≤ 50,000 ft <sup>2</sup>	4	Note 3
d. > 50,000 ft <sup>2</sup>	5	Note 3,4
3. Hotel/Motel		
a. ≤ 3 Stories	2	Note 6
b. > 3 Stories	6	Note 7
4. Light Manufacturing	1 or 3	
5. Office		
a. ≤ 20,000 ft <sup>2</sup>	1	
b. > 20,000 ft <sup>2</sup> and either		
≤ 3 floors or ≤ 75,000 ft <sup>2</sup>	4	
c. > 75,000 ft <sup>2</sup> or > 3 floors	5	
6. Restaurant	1 or 3	Note 2
7. Retail		
a. ≤ 50,000 ft <sup>2</sup>	1 or 3	Note 2
b. > 50,000 ft <sup>2</sup>	4 or 5	Note 2
8. Schools		
a. ≤ 75,000 ft <sup>2</sup> or ≤ 3 floors	1	
b. > 75,000 ft <sup>2</sup> or > 3 floors	3	
9. Warehouse		Note 5

Footnote to TABLE 3-3: The system and energy types presented in this table are not intended as requirements or recommendations for the proposed design. Floors areas in the table are the total conditioned floor areas for the listed use in the building. The number of floors indicated in the table is the total number of occupied floors for the listed use.

**TABLE 3-3 (cont.)**  
**HVAC System Descriptions for Prototype Buildings<sup>1</sup>**

HVAC Component	System #1	System #2
System Description	Packaged rooftop single zone, one unit per zone.	Packaged terminal air conditioner with space heater or heat pump, heating or cooling unit per zone.
Fan System		
Design Supply Circulation Rate	Note 10	Note 11
Supply Fan Control	Constant volume.	Fan cycles with call for heating or cooling.
Return Fan Control	N.A.	N.A.
Cooling System	Direct expansion air cooled	Direct expansion air cooled.

HVAC Component	System #1	System #2
Heating System	Furnace, heat pump, or electric resistance.	Heat pump with electric resistance auxiliary or air conditioner with space heater.
Remarks	Drybulb economizer per Section 1433, heat recovery if required by Section 1436.	No economizer, if not required by Section 1433.

**TABLE 3-3 (cont.)**  
**HVAC Systems Descriptions for Prototype Buildings<sup>1</sup>**

HVAC Component	System #3	System #4
System Description	Air handler per zone with central plant.	Packaged rooftop VAV with perimeter reheat and fan-powered terminal units.
Fan System		
Design Supply Circulation Rate	Note 10	Note 10
Supply Fan Control	Constant volume.	VAV with forward curved centrifugal fan and variable inlet fans.
Return Fan Control	Constant volume.	VAV with forward curved centrifugal fan and discharge dampers.
Cooling System	Chilled water (Note 12)	Direct expansion air cooled.
Heating System	Hot water (Note 13)	Hot water (Note 13) or electric resistance.
Remarks	Drybulb economizer per Section 1433, heat recovery if required by Section 1436.	Drybulb economizer per Section 1433. Minimum VAV setting per Section 1435. Exception 1, Supply air reset by zone of greatest cooling demand, heat recovery if required by Section 1436.

**TABLE 3-3 (cont.)**  
**HVAC System Descriptions for Prototype Buildings<sup>1</sup>**

HVAC Component	System #5	System #6
System Description	Built-up central VAV with perimeter reheat and fan-powered terminal units	Four-pipe fan coil per zone with central plant.
Fan System		
Design Supply Circulation Rate	Note 10	Note 10
Supply Fan Control	VAV with air-foil centrifugal fan and AC frequency variable speed drive.	Fan cycles with call for heating or cooling.

HVAC Component	System #5	System #6
Return Fan Control	VAV with air-foil centrifugal fan and AC frequency variable speed drive.	NA
Cooling System	Chilled water (Note 12)	Chilled water (Note 12)
Heating System	Hot water (Note 13) or electric resistance.	Hot water (Note 13) or electric resistance.
Remarks	Drybulb economizer per Section 1433. Minimum VAV setting per Section 1435. Exception 1, Supply air rest by zone of greatest cooling demand, heat recovery if required by Section 1436.	No economizer, if not required by Section 1433.

Numbered Footnotes for TABLE 3-3  
HVAC System Descriptions for Prototype Buildings

- The systems and energy types presented in this Table are not intended as requirements or recommendations for the proposed design.
- For occupancies such as restaurants, assembly and retail that are part of a mixed use building which, according to Table 3-3, includes a central chilled water plant (systems 3, 5, or 6), chilled water system type 3 or 5 shall be used as indicated in the table.
- Constant volume may be used in zones where pressurization relationships must be maintained by code. Where constant volume is used, the system shall have heat recovery if required by Section 1436. VAV shall be used in all other areas, in accordance with Sections 1432 through 1439.
- Provide run-around heat recovery systems for all fan systems with a minimum outside air intake greater than 70%. Recovery effectiveness shall be 0.50.
- If a warehouse is not intended to be mechanically cooled, both the standard and proposed designs shall be calculated assuming no mechanical cooling.
- The system listed is for guest rooms only. Areas such as public areas and back-of-house areas shall be served by system 4. Other areas such as offices and retail shall be served by systems listed in Table 3-3 for these occupancy types.
- The system listed is for guest rooms only. Areas such as public areas and back-of-house areas shall be served by system 5. Other areas such as offices and retail shall be served by systems listed in Table 3-3 for these occupancy types.
- Reserved.
- Reserved.
- Design supply air circulation rate shall be based on a supply-air-to-room air temperature difference of 20°F. A higher supply air temperature may be used if required to maintain a minimum circulation rate of 4.5 air changes per hour or 15 cfm per person to each zone served by the system, at design conditions. If return fans are specified, they shall be sized for the supply fan capacity less the required minimum ventilation with outside air, or 75% of the supply fan capacity, whichever is larger. Except where noted, supply and return fans shall be operated continuously during occupied hours.
- Fan energy when included in the efficiency rating of the unit as defined in Section 1411, need not be mod-

eled explicitly for this system. The fan shall cycle with calls for heating or cooling.

- Chilled water systems shall be modeled using a reciprocating chiller for systems with total cooling capacities less than 175 tons, and centrifugal chillers for systems with cooling capacities of 175 tons or greater. For systems with cooling capacities of 600 tons or more, the standard design energy consumption shall be calculated using two centrifugal chillers, lead/lag controlled. Chilled water shall be assumed to be controlled at a constant 44°F. Chiller water pumps shall be sized using a 12°F temperature rise, from 44°F to 56°F, operating at 65% combined impeller and motor efficiency. Condenser water pumps shall be sized using a 10°F temperature rise, operating at 60% combined impeller and motor efficiency. The cooling tower shall be an open circuit, centrifugal blower type sized for the larger of 85°F leaving water temperature or 10°F approach to design wetbulb temperature. The tower shall be controlled to provide a 65°F leaving water temperature whenever weather conditions permit, floating up to design leaving water temperatures at design conditions. Chilled water supply temperature shall be reset in accordance with Section 1432.2.2.
- Hot water system shall include a natural draft fossil fuel or electric boiler. The hot water pump shall be sized based on a 30°F temperature drop, from 180°F to 150°F, operating at a combined impeller and motor efficiency of 60%. Hot water supply temperature shall be reset in accordance with Section 1432.2.2.

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-99903, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-99903, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-99903, filed 10/18/93, effective 4/1/94.]

#### WAC 51-11-99904 Section 4—Suggested software for systems analysis approach.

Program Name	Source
Blast 3.0 (Level 334)	Blast Support Office University of Illinois Dept. of Mechanical and Industrial Engineering 1206 W. Green Street, Room 140, MEB Urbana, IL 61801 (217) 244-8182
DOE 2.1E	Energy Science and Technology Software Center (ESTSC) PO Box 1220 Oakridge, TN 37831-1020 423-576-2606
DOE 2.1E or DOE 2.2	James J. Hirsch & Associates Building Performance Analysis Software & Consulting 12185 Presilla Road Camarillo, CA 93012-9243 (805) 532-1045

<b>Program Name</b>	<b>Source</b>
EnergyPlus	Kathy Ellington Lawrence Berkeley National Laboratory (LBNL) Building 90, Room 3147 Berkeley, CA 94720-0001 (510) 486-5711
ESAS	Ross Meriweather Consulting, Engineering 3315 Outrider San Antonio, TX 78247-4405 210-490-7081
ESP-II	Automated Procedures for Engineering Consultants, Inc. 40 W. 4th Centre, Suite 2100 Dayton, OH 45402 937-228-2602
HAP 3.24	Carrier Building Systems and Services 3215 South 116th St., Suite 133 Tukwila, WA 98168 (206)-439-0097
Trace 600 Version 18.11 or Trace 700	The Trane Co. 3600 Pammel Creek Rd. Lacrosse, WI 54601 608-787-3926

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 01-03-010, § 51-11-99904, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-99904, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025, 93-21-052, § 51-11-99904, filed 10/18/93, effective 4/1/94.]

### Chapter 51-13 WAC

#### VENTILATION AND INDOOR AIR QUALITY 2006 EDITION

##### WAC

51-13-100	Chapter 1—Administration and enforcement.
51-13-101	Scope and general requirements.
51-13-102	Alternate systems and materials method of design, construction and installation.
51-13-103	Plans and specifications.
51-13-104	Enforcement and inspections.
51-13-105	Validity.
51-13-106	Conflicts with other codes.
51-13-107	Violations.
51-13-108	Liability.
51-13-200	Definitions.
51-13-201	General.
51-13-202	Definitions.
51-13-300	Chapter 3—Ventilation systems.
51-13-301	Compliance with this chapter.
51-13-302	Mechanical ventilation criteria using performance or design methods for Group R Occupancies four stories and less.
51-13-303	Mechanical ventilation criteria using prescriptive methods for Group R Occupancies four stories and less.
51-13-304	Mechanical ventilation criteria and minimum ventilation performance for all other occupancies not covered in sections 302 and 303.
51-13-400	Chapter 4—Indoor air quality.
51-13-401	Pollutant source control.
51-13-402	Solid fuel burning appliances and fireplaces.
51-13-500	Chapter 5—Radon resistive construction standards.
51-13-501	Scope.
51-13-502	Statewide radon requirements.
51-13-503	Radon prescriptive requirements.

(2007 Ed.)

### WAC 51-13-100 Chapter 1—Administration and enforcement.

[Statutory Authority: RCW 19.27.190, 91-01-102, § 51-13-100, filed 12/18/90, effective 7/1/91.]

#### WAC 51-13-101 Scope and general requirements.

101.1 Title: This Code shall be known as the Washington State Ventilation and Indoor Air Quality Code. It is herein referred to as "this Code."

101.2 Intent: The purpose of this Code is to provide minimum standards for the design and installation of mechanical ventilation systems, the selection of structural materials used within the conditioned space, and the construction of radon mitigation systems for new construction.

It is intended that these provisions provide flexibility to permit the use of innovative approaches and techniques. These provisions are structured to permit compliance with the intent of this Code by demonstration of performance through on site testing or through engineered design. This Code is not intended to abridge any safety or health requirements required under any other applicable codes or ordinances.

101.3 Scope: This Code sets forth minimum requirements for ventilation in all occupancies, including the design of new construction.

#### 101.3.1 Application to Existing Buildings

101.3.1.1 Additions to Existing Buildings: Additions to existing buildings or structures may be made without making the entire building comply, provided that the new addition shall conform to the provisions of this Code.

- EXCEPTIONS:
1. Additions with less than 500 square feet of conditioned floor area are exempt from the requirements in this code for Whole House Ventilation Systems, Section 302.2.2.
  2. Additions or alterations to existing buildings which do not require the construction of foundations, crawlspaces, slabs, or basements shall not be required to meet the requirements for radon protection.

101.3.1.2 Alterations and Repairs: All alterations and repairs may be made to existing or moved buildings built or permitted prior to the enforcement of this Code without making the entire building comply with the provisions of this Code, provided the alterations or repairs comply with this Code.

- EXCEPTION: Air handling/conditioning equipment, which is being replaced without alteration or repair of the associated air distribution system is exempt from the requirements of this Code.

101.3.1.3 Historic Buildings: Historic buildings are exempt from this Code only to the extent necessary to preserve those features essential to their historical appearance or function.

101.4 Operating Instructions: Installers shall provide the manufacturer's installation, operating instructions, and a whole house ventilation system operation description.

[Statutory Authority: RCW 19.27.190, 19.27.020, 01-02-099, § 51-13-101, filed 1/3/01, effective 7/1/01. Statutory Authority: RCW 19.27.190(2) and 1992 c 132, 93-02-056, § 51-13-101, filed 1/6/93, effective 7/1/93. Statutory

Authority: RCW 19.27.190. 91-01-102, § 51-13-101, filed 12/18/90, effective 7/1/91.]

### **WAC 51-13-102 Alternate systems and materials method of design, construction and installation.**

102.1 Alternate Materials and Methods of Construction: The provisions of this Code are not intended to prevent the use of any material, method of construction, design or ventilation system not specifically prescribed herein, provided that such construction, design, or ventilation system has been approved by the building official.

The building official may approve any such alternate, provided that the proposed design is satisfactory and complies with the provisions of this Code and that the material, method, or work offered is, for the purpose intended, at least the equivalent of that prescribed in this Code in suitability, effectiveness, safety, and indoor air quality.

The building official may require plans and specifications to be submitted in support of an application for a building permit. Plans and specifications may be required by the building official to be stamped and authenticated by an engineer or architect licensed by the state to practice as such.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-102, filed 12/18/90, effective 7/1/91.]

### **WAC 51-13-103 Plans and specifications.**

103.1 General: With each application for a building permit, and when required by the building official, plans and specifications demonstrating compliance with this Code shall be submitted. The building official may require that plans and specifications be stamped and authenticated by an engineer, architect, or other qualified professional licensed to practice in the state.

103.2 Details: The plans and specifications shall show in sufficient detail pertinent data and features of the materials, equipment and systems as herein governed, including, but not limited to: Design criteria, structural panel materials, size and type of apparatus and equipment, systems and equipment controls, provisions for combustion air to fuel burning appliances, and other pertinent data to indicate conformance with the requirements of this Code.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-103, filed 12/18/90, effective 7/1/91.]

### **WAC 51-13-104 Enforcement and inspections.**

104.1 General: Pertinent data and features of the building and the materials, equipment and/or systems as herein governed shall be subject to inspection by the building official.

104.2 Approvals Required: No materials, equipment, systems, or portions thereof, shall be concealed without first obtaining approval from the building official.

104.3 Tests: Whenever there is insufficient evidence of compliance with any of the provisions in this Code or evidence that any material or construction does not conform to the requirements of this Code, the building official may

require tests as proof of compliance to be made at no expense to the local jurisdiction.

Test methods shall be as specified by this Code or by other recognized test standards. If there are no recognized or accepted test methods for the proposed alternate, the building official shall determine test procedures.

104.4 Final Inspection: All materials, equipment, and systems herein governed shall be inspected and approved before the building shall be deemed ready for occupancy.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-104, filed 12/18/90, effective 7/1/91.]

### **WAC 51-13-105 Validity.**

105.1 Validity: If a section, subsection, sentence, clause, or phrase of this Code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portion of this Code.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-105, filed 12/18/90, effective 7/1/91.]

### **WAC 51-13-106 Conflicts with other codes.**

106.1 Conflicts with Other Codes: In addition to the requirements of this Code, buildings must conform to the provisions of the State Building Code (chapter 19.27 RCW and chapters 51-50, 51-52, 51-54 and 51-56 Washington Administrative Code). In case of conflicts between the International Building, Uniform Plumbing, International Mechanical, and International Fire Codes as adopted and amended in chapters 51-50, 51-52, 51-54 and 51-56 Washington Administrative Code, the provisions of chapter 51-13 shall govern. This Code is not intended to abridge any safety or health requirements under any other applicable codes or ordinances.

Where, in any specific case, different sections of this Code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.

Wherever in this Code reference is made to the appendix, the provisions of the appendix shall not apply unless specifically adopted.

106.2 Authority: Local legislative authorities are authorized and directed to enforce this Code. Local legislative authorities are authorized to promulgate, adopt, and issue those rules and regulations necessary for the effective and efficient administration of this Code.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-106, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190 and 19.27.020. 98-02-047, § 51-13-106, filed 1/5/98, effective 7/1/98. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-106, filed 12/21/94, effective 6/30/95; 91-01-102, § 51-13-106, filed 12/18/90, effective 7/1/91.]

### **WAC 51-13-107 Violations.**

107.1 Violations: It shall be unlawful for any persons, firm, or corporation to erect or construct any building, or remodel or rehabilitate any existing building or structure in

the state, or allow the same to be done in violation of any of the provisions of this Code.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-107, filed 12/18/90, effective 7/1/91.]

#### **WAC 51-13-108 Liability.**

108.1 Liability: Nothing contained in this Code is intended to be nor shall be construed to create nor form the basis for any liability on the part of any city or county or its officers, employees, or agents for any injury or damage resulting from the failure of a building to conform to the provisions of this Code.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-108, filed 12/18/90, effective 7/1/91.]

#### **WAC 51-13-200 Definitions.**

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-200, filed 12/18/90, effective 7/1/91.]

#### **WAC 51-13-201 General.**

201.1 General: For the purposes of this Code, certain terms, phrases, words, and their derivatives shall be construed as specified in this section. Words used is the singular include the plural and the plural, the singular. Words used in the masculine gender include the feminine and feminine, the masculine.

Where terms are not defined in this section, the definitions shall be taken from Chapter 2 of the International Building Code.

Where terms are not defined in either this section or Chapter 2 of the International Building Code, such terms shall have ordinarily accepted meanings such as the context implies.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-201, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-201, filed 12/21/94, effective 6/30/95; 91-01-102, § 51-13-201, filed 12/18/90, effective 7/1/91.]

#### **WAC 51-13-202 Definitions.**

**Addition:** An extension or increase in floor area or height of a building or structure.

**Aggregate:** Crushed stone, stone, or other inert material, or combinations thereof having hard, strong, durable pieces.

**Air barrier:** A continuous material or system of materials utilized for the purpose of minimizing the movement of air across a defined boundary, and capable of withstanding the maximum pressure developed across it, without failing by becoming significantly more leaky.

**Air, exhaust:** Air removed from a space and not reused therein.

**Air, outdoor:** Air taken from the external atmosphere and, therefore, not previously circulated through the HVAC system or the conditioned space.

(2007 Ed.)

**Air, supply:** That air delivered to the conditioned space and used for ventilation, heating, cooling, humidification, or dehumidification.

**Air, transfer:** The movement of indoor air from one space to another.

**Air, ventilation:** That portion of supply air that is outdoor air plus any recirculated air that has been treated for the purpose of maintaining acceptable indoor air quality.

**AMCA:** Air Movement and Control Association, Inc.

**Approved:** As to material and types of construction, refers to approved by the building official as the result of investigation and tests conducted by him, or by reason of accepted principles or tests by recognized authorities, technical or scientific organizations.

**ASHRAE:** American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.

**Automatic:** Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for example, a change in current strength, pressure, temperature, or mechanical configuration.

**Back-draft damper:** A damper installed to restrict introduction of unconditioned air from an unconditioned space to a conditioned space.

**Barometric damper:** Shall be any listed nonmanual device that freely allows the flow of air in one direction, but does not allow conditioned air to escape. Any installed combustion air damper shall meet the installation requirements of the manufacturer.

**Building official:** The officer or other designated authority charged with the administration and enforcement of this Code, or his duly authorized representative.

**Certified local government:** The local government has been certified by the state historical preservation officer as having established its own historic preservation commission and a program meeting federal and state standards.

**CFM:** Cubic feet per minute.

**Conditioned floor area:** The floor area within the conditioned space.

**Conditioned space:** That part of a building that is heated or cooled or both for the comfort of occupants.

**Dehumidistat:** An automatic control device which measures changes in humidity and controls a device(s) for maintaining a maximum specified humidity range or level.

**Exfiltration:** The uncontrolled outward air leakage through cracks and concealed spaces in any building element and around sole plates, wall outlets, duct systems, windows, and doors of a building, caused by the pressure effect of wind and/or the effect of differences in the indoor and outdoor air density.

**Gravel:** A type of aggregate.

**Habitable space (room):** Space in a structure for living, sleeping, eating, or cooking. Bathrooms, toilet compartments, closets, halls, storage, or utility space and similar areas, are not considered habitable space. For the purpose of this Code, a single habitable space may consist of adjoining rooms when one half of the area of the common wall is open and unobstructed and provides an opening of not less than one-tenth of the floor area of the interior room or twenty five square feet, whichever is greater.

**Heat recovery ventilation system:** A device or combination of devices applied to provide the outdoor air for ventilation in which energy is transferred between the intake and exhaust airstream.

**Historic buildings:** Any structure, collection of structures, and their associated sites, deemed of importance to the history, architecture, or culture of an area by an appropriate local, state, or federal government jurisdiction. This includes structures on official national, state, or local listings such as the National Register of Historic Places, the State Register of Historic Places, state points of historical interest, and registers or listings of historical or architecturally significant sites, places, historic districts, or landmarks as adopted by a certified local government.

**Humidistat:** An automatic control device which measures changes in humidity and controls a device(s) for maintaining a minimum specified humidity range or level.

**HVAC:** Heating, ventilating, and air conditioning.

**HVI:** Home Ventilating Institute of America, Inc.

**Infiltration:** The uncontrolled inward air leakage through cracks and concealed spaces in any building element and around sole plates, wall outlets, duct systems, windows, and doors of a building, caused by the pressure effect of wind and/or the effect of differences in the indoor and outdoor air density.

**"J" Definitions:** (Reserved)

**"K" Definitions:** (Reserved)

**"L" Definitions:** (Reserved)

**Manual:** Capable of being operated by human intervention.

**Masonry heater:** A heating system which is predominantly masonry construction, having a mass of at least 1764 pounds (800 kg) excluding chimney and base. Within the masonry mass are contained a firebox and multiple heat exchange channels which store the heat and allow for extremely high temperature fires to be burned.

**Mitigate:** To design, select, apply, and install systems, materials, and processes that reduce radon concentrations in the indoor air of a building, and/or prevent entry of radon into the indoor air of a building, so that the average indoor radon concentration is reduced to an acceptable level.

**New construction:** Any building, addition or change in occupancy permitted on or after the effective date of this Code.

**"O" Definitions:** (Reserved)

**Picocurie, pCi:** A measure of radioactive activity equal to one trillionth of a curie. A curie is the amount of any radionuclide that undergoes thirty seven billion nuclear disintegrations per second, hence a picocurie is .037 nuclear disintegrations per second.

**Picocurie per liter, pCi/L:** A common unit of measurement of the concentration of radioactivity in a gas. One pCi/L corresponds to 2.22 radioactive disintegrations per minute per liter of air.

**"Q" Definitions:** (Reserved)

**R value:** (See **Thermal resistance (R)**)

**Readily accessible:** Readily accessible means capable of being reached safely and quickly for operation, repair, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles, or to resort to the use of portable access equipment.

**Soil depressurization system (SDS):** A radon control technique that depressurizes the space below a concrete slab or other soil gas retarder relative to the space above it. The purpose of SDS is to maintain a slightly lower pressure in the soil gas under the slab or other soil gas retarder, compared to the indoor pressure above it, to ensure that flows are from the indoors to the soil, thus preventing mass transport of radon contaminated soil gas to the indoor air.

**Soil gas retarder membrane:** A flexible sheet material placed between the soil and the indoor air for the purpose of reducing the flow of soil gas into the building.

**Solid fuel burning appliance:** Any factory-built appliance designed to burn solid fuels.

**Source specific ventilation system:** A mechanical ventilation system including all fans, controls, and ducting, which is dedicated to exhausting contaminant-laden air to the exterior of the building from the room or space in which the contaminant is generated.

**System:** A combination of equipment and/or controls, accessories, interconnecting means, and terminal elements by which air is transferred.

**Terminal element:** The means by which the transferred air from a system is finally delivered; i.e., registers, diffusers, through-the-wall vents, roof caps, etc.

**Thermal resistance (R):** The resistance of a material to heat flow, measured as the inverse of heat flow per unit area, per unit time, per unit temperature difference across the thickness of material considered. In this Code, R has units of sq.ft./hr.°F/Btu.

**Thermostat:** An instrument which measures changes in temperature and control device(s) for maintaining a desired temperature.

**Unconditioned space:** (See **Conditioned space**)

**Ventilation:** The process of supplying and removing air by natural or mechanical means to and from any space. Such air may or may not be conditioned.

**Ventilation, mechanical:** The introduction and distribution of outdoor air and the removal of indoor air by mechanical means.

**Ventilation, natural:** Ventilation other than by mechanical means.

**Virgin polyethylene:** Extruded polyethylene sheets made from nonreprocessed resins.

**Whole house ventilation system:** A mechanical ventilation system, including fans, controls, and ducts, which replaces, by direct or indirect means, air from the habitable rooms with outdoor air.

**Wood stove:** (See **Solid fuel burning appliance**)

**"X" Definitions:** (Reserved)

**"Y" Definitions:** (Reserved)

**Zone:** A space or group of spaces within a building with heating and/or cooling requirements sufficiently similar so that comfort conditions can be maintained throughout by a single controlling device.

[Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-202, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-202, filed 12/18/90, effective 7/1/91.]

### WAC 51-13-300 Chapter 3—Ventilation systems.

[Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-300, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-300, filed 12/18/90, effective 7/1/91.]

#### WAC 51-13-301 Compliance with this chapter.

301.1 General: The criteria of this chapter establish the design conditions upon which the minimum ventilation systems are to be based for all occupancies. Group R Occupancies four (4) stories and less as defined by the Washington State Building Code shall comply with either Section 302 or 303. Section 304 applies to all other occupancies.

301.2 Testing: At the discretion of the building official, flow testing may be required to verify that the mechanical system(s) satisfies the requirements of this section. Flow testing may be performed using flow hoods measuring at the intake or exhaust points of the system, in-line pitot tube, or pitot-traverse type measurement systems in the duct, short term tracer gas measurements, or other means approved by the building official.

[Statutory Authority: RCW 19.27.190, 19.27.020. 01-02-099, § 51-13-301, filed 1/3/01, effective 7/1/01. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-301, filed 12/18/90, effective 7/1/91.]

#### WAC 51-13-302 Mechanical ventilation criteria using performance or design methods for Group R Occupancies four stories and less.

302.1 Applicability: Group R Occupancies four (4) stories and less as defined by the Washington State Building Code shall comply with either this section or Section 303.

(2007 Ed.)

302.1.1 Compliance by Calculations or Testing: Compliance with this section shall be demonstrated through engineering calculation or performance testing. Documentation of calculations or performance test results shall be submitted to the building official. Performance testing shall be conducted in accordance with recognized test methods.

302.1.2 Minimum Ventilation Performance: Each dwelling unit or guest room shall be equipped with source specific and whole house ventilation systems designed and installed to satisfy the ventilation requirements of this section.

All public corridors shall meet the ventilation requirements in section 1203 of the International Building Code.

#### 302.2 Source Specific Ventilation Requirements.

302.2.1 Source Specific Ventilation: Source specific exhaust ventilation is required in each kitchen, bathroom, water closet, laundry room, indoor swimming pool, spa, and other rooms where excess water vapor or cooking odor is produced.

The minimum source specific ventilation effective exhaust capacity shall be not less than levels specified in Table 3-1.

302.2.2 Source Specific Ventilation Controls: Source specific ventilation systems shall be controlled by manual switches, dehumidistats, timers, or other approved means. Source specific ventilation system controls shall be readily accessible.

302.2.3 Source Specific Ventilation Ducts: Source specific ventilation ducts shall terminate outside the building. Exhaust ducts in systems which are designed to operate intermittently shall be equipped with back-draft dampers. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4. Terminal elements shall have at least the equivalent net free area of the duct work. Terminal elements for exhaust fan duct systems shall be screened or otherwise protected from entry by leaves or other material.

#### 302.3 Requirements for Whole House Ventilation Systems.

302.3.1 Whole House Ventilation Systems: Each dwelling unit shall be equipped with a whole house ventilation system which shall be capable of providing the volume of outdoor air specified in Table 3-2 under normal operating conditions.

EXCEPTION: Maximum flow rates listed in Table 3-2 do not apply to heat recovery ventilation systems.

302.3.2 Whole House Ventilation System Controls: All ventilation system controls shall be readily accessible. Controls for whole house ventilation systems shall be capable of operating the ventilation system without energizing other energy-consuming appliances.

Intermittently operated whole house ventilation systems shall be constructed to have the capability for continuous operation, and shall have a manual control and an automatic control, such as a clock timer. At the time of final inspection, the automatic control timer shall be set to operate the whole



house fan for at least eight hours a day. A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

**302.3.3 Fan Noise:** Whole house fans located four feet or less from the interior grille shall have a sone rating of 1.5 or less measured at 0.1 inches water gauge. Manufacturer's noise ratings shall be determined as per HVI 915 (October 1995). Remotely mounted fans shall be acoustically isolated from the structural elements of the building and from attached duct work using insulated flexible duct or other approved material.

**EXCEPTION:** Whole house ventilation systems which are integrated with forced-air heating systems or heat-recovery ventilation systems are exempt from the sone rating requirements of this section.

**302.3.4 Whole House Ventilation Ducts:** All ducts shall terminate outside the building. Exhaust ducts in systems which are designed to operate intermittently shall be equipped with back-draft dampers. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4. All supply ducts in the conditioned space shall be insulated to a minimum of R-4.

### 302.3.5 Outdoor Air.

**302.3.5.1 Outdoor Air Supply:** A mechanical system shall supply outdoor air as required in Section 302.3.1. The mechanical system may consist of exhaust fans, supply fans, or both.

**302.3.5.2 Outdoor Air Inlets:** Inlets shall be screened or otherwise protected from entry by leaves or other material. Outdoor air inlets shall be located so as not to take air from the following areas:

- a) Closer than ten feet from an appliance vent outlet, unless such vent outlet is three feet above the outdoor air inlet.
- b) Where it will pick up objectionable odors, fumes, or flammable vapors.
- c) A hazardous or unsanitary location.
- d) A room or space having any fuel-burning appliances therein.
- e) Closer than ten feet from a vent opening of a plumbing drainage system unless the vent opening is at least three feet above the air inlet.
- f) Attic, crawl spaces, garages.

**302.3.5.3 Outdoor Air Distribution:** Outdoor air shall be distributed to each habitable room by means such as individual inlets, separate duct systems, or a forced-air system. Where outdoor air supplies are separated from exhaust points by doors, provisions shall be made to ensure air flow by installation of distribution ducts, undercutting doors, installation of grilles, transoms, or similar means where permitted by the International Building Code. Doors shall be undercut to a minimum of one-half inch above the surface of the finish floor covering.

**302.3.5.4 Doors and operable lites in windows** are deemed not to meet the outdoor air supply intake requirements.

**302.3.5.5 Individual Room Outdoor Air Inlets:** Where provided, individual room outdoor air inlets shall:

- a) Have controllable and secure openings;
- b) Be sleeved or otherwise designed so as not to compromise the thermal properties of the wall or window in which they are placed.

**302.3.5.6 Ventilation Integrated with Forced-Air Systems:** Where outdoor air is provided by a forced-air system, the outdoor air connection to the return air stream shall be located upstream of the forced-air system blower and shall not be connected directly into a furnace cabinet to prevent thermal shock to the heat exchanger.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-302, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190, 19.27.020. 01-02-099, § 51-13-302, filed 1/3/01, effective 7/1/01. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-302, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-302, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-302, filed 12/18/90, effective 7/1/91.]

## **WAC 51-13-303 Mechanical ventilation criteria using prescriptive methods for Group R Occupancies four stories and less.**

**303.1 Applicability:** Group R Occupancies 4 stories or less shall comply with this section or Section 302. This section establishes minimum prescriptive design requirements for intermittently operated systems. Continuously operated systems shall comply with Section 302. A system which meets the requirements of this section shall be deemed to satisfy the requirements of this chapter.

**303.2 Minimum Ventilation Performance:** Each dwelling unit or guest room shall be equipped with source specific and whole house ventilation systems designed and installed to satisfy the ventilation requirements of this section. All public corridors shall meet the ventilation requirements in Section 1203 of the International Building Code.

**303.3 Source Specific Exhaust Ventilation Requirements.**

**303.3.1 Source Specific Ventilation:** Source specific exhaust ventilation is required in each kitchen, bathroom, water closet, laundry room, indoor swimming pool, spa, and other rooms where excess water vapor or cooking odor is produced. The minimum source specific ventilation effective exhaust capacity shall be not less than levels specified in Table 3-1.

**303.3.2 Source Specific Exhaust Fans:** Exhaust fans providing source specific ventilation shall have a minimum fan flow rating not less than 50 cfm at 0.25 inches water gauge for bathrooms, laundries, or similar rooms and 100 cfm at 0.25 inches water gauge for kitchens. Manufacturers' fan flow ratings shall be determined as per HVI 916 (April 1995) or AMCA 210.

**EXCEPTION:** Where a range hood or down draft exhaust fan is used to satisfy the source specific ventilation requirements

for kitchens, the range hood or down draft exhaust shall not be less than 100 cfm at 0.10 inches water gauge.

**303.3.3 Source Specific Ventilation Controls:** Source specific ventilation systems shall be controlled by manual switches, dehumidistats, timers, or other approved means. Source specific ventilation system controls shall be readily accessible.

**303.3.4 Source Specific Ventilation Ducts:** Source specific ventilation ducts shall terminate outside the building. Exhaust ducts shall be equipped with back-draft dampers. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4. Terminal elements shall have at least the equivalent net free area of the duct work. Terminal elements for exhaust fan duct systems shall be screened or otherwise protected from entry by leaves or other material.

**303.4 Prescriptive Whole House Ventilation Systems:** Whole house ventilation shall be provided by a system that meets the requirements of either Section 303.3.1, 303.3.2, 303.3.3, or 303.3.4. A system which meets all of the requirements of one of these sections shall be deemed to satisfy the requirements for a whole house ventilation system.

**303.4.1 Intermittent Whole House Ventilation Using Exhaust Fans:** This section establishes minimum prescriptive requirements for intermittent whole house ventilation systems using exhaust fans. A system which meets all the requirements of this section shall be deemed to satisfy the requirements for a whole house ventilation system.

**303.4.1.1 Whole House Ventilation Fans:** Exhaust fans providing whole house ventilation shall have a flow rating at 0.25 inches water gauge as specified in Table 3-2. Manufacturers' fan flow ratings shall be determined according to HVI 916 (April 1995) or AMCA 210.

**303.4.1.2 Fan Noise:** Whole house fans located four feet or less from the interior grille shall have a sone rating of 1.5 or less measured at 0.1 inches water gauge. Manufacturer's noise ratings shall be determined as per HVI 915 (October 1995). Remotely mounted fans shall be acoustically isolated from the structural elements of the building and from attached duct work using insulated flexible duct or other approved material.

**303.4.1.3 Fan Controls:** The whole house ventilation fan shall be controlled by a 24-hour clock timer with the capability of continuous operation, manual and automatic control. The 24-hour timer shall be readily accessible. The 24-hour timer shall be capable of operating the whole house ventilation fan without energizing other energy-consuming appliances. At the time of final inspection, the automatic control timer shall be set to operate the whole house fan for at least eight hours a day. A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

**303.4.1.4 Exhaust Ducts:** All exhaust ducts shall terminate outside the building. Exhaust ducts shall be equipped with back-draft dampers. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4.

**303.4.1.5 Outdoor Air Inlets:** Outdoor air shall be distributed to each habitable room by individual outdoor air inlets. Where outdoor air supplies are separated from exhaust points by doors, provisions shall be made to ensure air flow by installation of distribution ducts, undercutting doors, installation of grilles, transoms, or similar means where permitted by the International Building Code. Doors shall be undercut to a minimum of one-half inch above the surface of the finish floor covering.

Individual room outdoor air inlets shall:

- a. Have controllable and secure openings;
- b. Be sleeved or otherwise designed so as not to compromise the thermal properties of the wall or window in which they are placed;
- c. Provide not less than four square inches of net free area of opening for each habitable space. Any inlet or combination of inlets which provide 10 cfm at 10 Pascals as determined by the Home Ventilating Institute Air Flow Test Standard (HVI 901 (November 1996)) are deemed equivalent to four square inches net free area.

Inlets shall be screened or otherwise protected from entry by leaves or other material. Outdoor air inlets shall be located so as not to take air from the following areas:

- a. Closer than 10 feet from an appliance vent outlet, unless such vent outlet is 3 feet above the outdoor air inlet.
- b. Where it will pick up objectionable odors, fumes or flammable vapors.
- c. A hazardous or unsanitary location.
- d. A room or space having any fuel-burning appliances therein.
- e. Closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.
- f. Attic, crawl spaces, or garages.

**EXCEPTION:** Exhaust only ventilation systems do not require outdoor air inlets if the home has a ducted forced air heating system that communicates with all habitable rooms and the interior doors are undercut to a minimum of one-half inch above the surface of the finish floor covering.

**303.4.2 Prescriptive Requirements for Intermittent Whole House Ventilation Integrated with a Forced-Air System:** This section establishes minimum prescriptive requirements for intermittent whole house ventilation systems integrated with forced-air ventilation systems. A system which meets all the requirements of this section shall be deemed to satisfy the requirements for a whole house ventilation system.

**303.4.2.1 Integrated Whole House Ventilation Systems:** Integrated Whole House Ventilation Systems shall provide outdoor air at the rates specified in Table 3-2. Integrated Forced-Air Ventilation Systems shall distribute outdoor air to each habitable room through the forced-air system ducts. Integrated Forced-Air Ventilation Systems shall have an outdoor air inlet duct connecting a terminal element on the outside of the building to the return air plenum of the forced-air system, at a point within four (4) feet upstream of the air handler. The outdoor air inlet duct connection to the return air stream shall be located upstream of the forced-air system blower and shall not be connected directly into a furnace cabinet to prevent thermal shock to the heat exchanger. The out-

door air inlet duct shall be prescriptively sized in accordance with Table 3-5. The system will be equipped with one of the following:

1. A motorized damper connected to the automatic ventilation control as specified in Section 303.3.2.2; or
2. A damper installed and set to meet minimum flow rates as specified in Table 3-2, by either field testing or following manufacturer's installation instructions based on site conditions; or
3. An automatic flow regulated device with field measured or field calculated minimum negative pressure of 0.07 inches water gauge at the point where the outside air duct is connected to the return air plenum.

**303.4.2.2 Ventilation Controls:** The whole house ventilation system shall be controlled by a 24-hour clock timer with the capability of continuous operation, manual and automatic control. This control will control the forced air system blower and if applicable the automatic damper. The 24-hour timer shall be readily accessible. The 24-hour timer shall be capable of operating the whole house ventilation system without energizing other energy-consuming appliances. At the time of final inspection, the automatic control timer shall be set to operate the whole house system for at least eight hours a day. A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

**303.4.2.3 Ventilation Duct Insulation:** All supply ducts in the conditioned space shall be insulated to a minimum of R-4.

**303.4.2.4 Outdoor Air Inlets:** Inlets shall be screened or otherwise protected from entry by leaves or other material. Outdoor air inlets shall be located so as not to take air from the following areas:

- a. Closer than 10 feet from an appliance vent outlet, unless such vent outlet is 3 feet above the outdoor air inlet.
- b. Where it will pick up objectionable odors, fumes or flammable vapors.
- c. A hazardous or unsanitary location.
- d. A room or space having any fuel-burning appliances therein.
- e. Closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.
- f. Attic, crawl spaces, or garages.

**303.4.3 Prescriptive Requirements for Intermittent Whole House Ventilation Using a Supply Fan:** This section establishes minimum prescriptive requirements for intermittent whole house ventilation systems using an inline supply fan. A system which meets all the requirements of this section shall be deemed to satisfy the requirements for a whole house ventilation system.

**303.4.3.1 Outdoor Air: Supply Fan Ventilation Systems** shall distribute outdoor air to each habitable room through the forced-air system ducts or through dedicated ducts to each habitable room. Supply fans shall have the capacity to provide the amount of outdoor air specified in Table 3-2 at 0.4 inches water gauge as per HVI 916 (April 1995). The outdoor air must be filtered before it is delivered to habitable rooms. The filter may be located at the intake device, inline

with the fan, or, in the case of a connection to the return plenum of the airhandler, using the furnace filter. An outdoor air inlet shall be connected to either the supply or return air stream.

**303.4.3.2 Ducts:** An outdoor air inlet duct connection to the supply air stream shall be located downstream of the forced-air system blower. An outdoor air inlet duct connection to the return air stream shall be located at least four feet upstream of the forced-air system blower and its filter. Neither type of duct shall be connected directly into a furnace cabinet to prevent thermal shock to the heat exchanger. The outdoor air inlet duct shall be prescriptively sized in accordance with Table 3-6. The terminal element on the outside of the building shall be sized two inches in diameter larger than the outdoor air inlet duct.

**303.4.3.3 Dampers:** The system shall be equipped with a back-draft damper and one of the following:

1. A calibrated manual volume damper installed and set to meet the measured flow rates specified in Table 3-2 by field testing with a pressure gauge and/or following manufacturer's installation instructions, or
2. A manual volume damper installed and set to meet the measured flow rates specified in Table 3-2 by field testing with a flow hood or a flow measuring station; or
3. An automatic flow-regulating device sized to the specified flow rates in Table 3-2 which provides constant flow over a pressure range of 0.2 to 0.6 inches water gauge.

**303.4.3.4 Ventilation Controls:** The whole house ventilation system shall be controlled by a 24 hour clock timer with the capability of continuous operation, manual and automatic control. This control will control the inline supply fan. The 24-hour timer shall be readily accessible. The 24 hour timer shall be capable of operating the whole house ventilation system without energizing other energy-consuming appliances. At the time of final inspection, the automatic control timer shall be set to operate the whole house system for at least eight hours a day. A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

**303.4.3.5 Ventilation Duct Insulation:** All supply ducts in the conditioned space shall be insulated to a minimum of R-4.

**303.4.3.6 Outdoor Air Inlets:** Inlets shall be screened or otherwise protected from entry by leaves or other material. Outdoor air inlets shall be located so as not to take air from the following areas:

- a. Closer than 10 feet from an appliance vent outlet, unless such vent outlet is 3 feet above the outdoor air inlet.
- b. Where it will pick up objectionable odors, fumes or flammable vapors.
- c. A hazardous or unsanitary location.
- d. A room or space having any fuel-burning appliances therein.
- e. Closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.
- f. Attic, crawl spaces, or garages.

**303.4.4 Prescriptive Requirements for Intermittent Whole House Ventilation Using a Heat Recovery Ventilation System:** This section establishes minimum prescriptive requirements for intermittent whole house ventilation using a heat recovery ventilation system.

**303.4.4.1 Heat Recovery Ventilation Systems:** All duct work in heat recovery ventilation systems shall be not less than six inch diameter. Balancing dampers shall be installed on the inlet and exhaust side. Flow measurement grids shall be installed on the supply and return. System minimum flow rating shall be not less than that specified in Table 3-2. Maximum flow rates in Table 3-2 do not apply to heat recovery ventilation systems.

**303.4.4.2 Ventilation Controls:** The whole house ventilation system shall be controlled by a 24 hour clock timer with the capability of continuous operation, manual and automatic control. This control will control the inline supply fan. The 24-hour timer shall be readily accessible. The 24-hour timer shall be capable of operating the whole house ventilation system without energizing other energy-consuming appliances. At the time of final inspection, the automatic control timer shall be set to operate the whole house system for at least eight hours a day. A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

**303.4.4.3 Ventilation Duct Insulation:** All supply ducts in the conditioned space installed upstream of the heat exchanger shall be insulated to a minimum of R-4.

**303.4.4.4 Outdoor Air Inlets:** Inlets shall be screened or otherwise protected from entry by leaves or other material. Outdoor air inlets shall be located so as not to take air from the following areas:

- Closer than 10 feet from an appliance vent outlet, unless such vent outlet is 3 feet above the outdoor air inlet.
- Where it will pick up objectionable odors, fumes or flammable vapors.
- A hazardous or unsanitary location.
- A room or space having any fuel-burning appliances therein.
- Closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.
- Attic, crawl spaces, or garages.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-303, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190, 19.27.020. 01-02-099, § 51-13-303, filed 1/3/01, effective 7/1/01. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-303, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-303, filed 12/18/90, effective 7/1/91.]

**WAC 51-13-304 Mechanical ventilation criteria and minimum ventilation performance for all other occupancies not covered in sections 302 and 303.**

**304.1 Ventilation:** The minimum requirements for operable area to provide natural ventilation are specified in the International Building Code (IBC) as adopted by the state of Washington.

(2007 Ed.)

Where a mechanical ventilation system is installed, the mechanical ventilation system shall be capable of supplying ventilation air to each zone with the minimum outdoor air quantities specified in Table 3-4.

**EXCEPTION:** Where occupancy density is known and documented in the plans, the outside air rate may be based on the design occupant density. Under no circumstance shall the occupancies used result in outside air less than one-half that resulting from application of Table 3-4 estimated maximum occupancy values.

The outdoor air shall be ducted in a fully enclosed path directly to every air handling unit in each zone not provided with sufficient operable area for natural ventilation.

**EXCEPTION:** Ducts may terminate within 12 inches of the intake to an HVAC unit provided they are physically fastened so that the outside air duct is directed into the unit intake.

In all parking garages, other than open parking garages as defined in IBC 406.3, used for storing or handling of automobiles operating under their own power and on all loading platforms in bus terminals, ventilation shall be provided at 1.5 cfm per square foot of gross floor area. The building official may approve an alternate ventilation system designed to exhaust a minimum fourteen thousand cfm for each operating vehicle. Such system shall be based on the anticipated instantaneous movement rate of vehicles but not less than 2.5 percent (or one vehicle) of the garage capacity. Automatic carbon monoxide sensing systems may be submitted for approval.

In all buildings used for the repair of automobiles, each repair stall shall be equipped with an exhaust extension duct, extending to the outside of the building, which if over ten feet in length, shall mechanically exhaust three hundred cfm. Connecting offices and waiting rooms shall be supplied with conditioned air under positive pressure.

Combustion air requirements shall conform to the requirements of Chapter 7 of the International Mechanical Code (IMC).

Mechanical refrigerating equipment and rooms storing refrigerants shall conform to the requirements of Chapter 11 of the IMC.

**304.2 Alternate Systems:** Alternate systems designed in accordance with ASHRAE Standard 62.1.2004 shall be permitted.

TABLE 3-1  
Minimum Source Specific Ventilation Capacity  
Requirements

	Bathrooms	Kitchens
Intermittently operating	50 cfm	100 cfm
Continuous operation	20 cfm	25 cfm

[Title 51 WAC—p. 129]

**TABLE 3-2**  
**Ventilation Rates For All Group R Occupancies four (4) stories and less\***  
 Minimum and Maximum Ventilation Rates: Cubic Feet Per Minute (CFM)

Floor Area, ft <sup>2</sup>	Bedrooms													
	2 or less		3		4		5		6		7		8	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
<500	50	75	65	98	80	120	95	143	110	165	125	188	140	210
501-1000	55	83	70	105	85	128	100	150	115	173	130	195	145	218
1001-1500	60	90	75	113	90	135	105	158	120	180	135	203	150	225
1501-2000	65	98	80	120	95	143	110	165	125	188	140	210	155	233
2001-2500	70	105	85	128	100	150	115	173	130	195	145	218	160	240
2501-3000	75	113	90	135	105	158	120	180	135	203	150	225	165	248
3001-3500	80	120	95	143	110	165	125	188	140	210	155	233	170	255
3501-4000	85	128	100	150	115	173	130	195	145	218	160	240	175	263
4001-5000	95	143	110	165	125	188	140	210	155	233	170	255	185	278
5001-6000	105	158	120	180	135	203	150	225	165	248	180	270	195	293
6001-7000	115	173	130	195	145	218	160	240	175	263	190	285	205	308
7001-8000	125	188	140	210	155	233	170	255	185	278	200	300	215	323
8001-9000	135	203	150	225	165	248	180	270	195	293	210	315	225	338
>9000	145	218	160	240	175	263	190	285	205	308	220	330	235	353

\*For residences that exceed 8 bedrooms, increase the minimum requirement listed for 8 bedrooms by an additional 15 CFM per bedroom. The maximum CFM is equal to 1.5 times the minimum.

**TABLE 3-3**  
 Prescriptive Exhaust Duct Sizing

Fan Tested CFM @ 0.25 W.G.	Minimum Flex Diameter	Maximum Length Feet	Minimum Smooth Diameter	Maximum Length Feet	Maximum Elbows <sup>1</sup>
50	4 inch	25	4 inch	70	3
50	5 inch	90	5 inch	100	3
50	6 inch	No Limit	6 inch	No Limit	3
80	4 inch <sup>2</sup>	NA	4 inch	20	3
80	5 inch	15	5 inch	100	3
80	6 inch	90	6 inch	No Limit	3
100	5 inch <sup>2</sup>	NA	5 inch	50	3
100	6 inch	45	6 inch	No Limit	3
125	6 inch	15	6 inch	No Limit	3
125	7 inch	70	7 inch	No Limit	3

- For each additional elbow subtract 10 feet from length.
- Flex ducts of this diameter are not permitted with fans of this size.

**TABLE 3-4**  
 Outdoor air requirements for ventilation<sup>1</sup>  
 Occupancies not subject to sections 302 and 303

Application	Estimated Maximum <sup>2</sup> Occupancy P/1000 ft <sup>2</sup> or 100 m <sup>2</sup>	Outdoor Air Requirements cfm/person
<b>Dry Cleaners, Laundries<sup>3</sup></b>		
Commercial laundry	10	25
Commercial dry cleaner	30	30
Storage, pick up	30	35
Coin-operated laundries	20	15
Coin-operated dry cleaner	20	15
<b>Dwelling Units In Buildings Greater Than Four Stories or Attached to I-Occupancy Facilities</b>		
Bedroom & living area <sup>24</sup>		15
<b>Food and Beverage Service</b>		
Dining rooms	70	20
Cafeteria, fast food	100	20
Bars, cocktail lounges <sup>4</sup>	100	30
Kitchens (cooking) <sup>23</sup>	20	15
<b>Garages, Repair, Service Stations</b>		
Enclosed parking garage <sup>5</sup>		1.50 cfm/ft.sq.
Auto repair rooms		1.50 cfm/ft.sq.
<b>Hotels, Motels, Resorts, Congregate Residences with More Than Four Stories<sup>6</sup></b>		
Bedrooms		30 cfm/room
Living Rooms		30 cfm/room

Application	Estimated Maximum <sup>2</sup> Occupancy P/1000 ft <sup>2</sup> or 100 m <sup>2</sup>	Outdoor Air Requirements cfm/person
Bath <sup>7</sup>		35 cfm/room
Lobbies	30	15
Conference rooms	50	20
Assembly rooms	120	15
Gambling casinos <sup>4</sup>	120	30
<b>Offices</b>		
Office space <sup>9</sup>	7	20
Reception area	60	15
Telecommunication centers and data entry areas	60	20
Conference rooms	50	20
<b>Public Spaces</b>		
Corridors and utilities		0.05 cfm/ft.sq.
Public restroom, cfm/wc or urinal <sup>10</sup>		50
Lockers and dressing rooms		0.50 cfm/ft.sq.
Smoking lounge <sup>11</sup>	70	60
Elevators <sup>12</sup>		1.0 cfm/ft.sq.
<b>Retail Stores, Sales Floors, and Show Room Floors</b>		
Basement and street	30	0.30 cfm/ft.sq.
Upper floors	20	0.20 cfm/ft.sq.
Storage rooms	15	0.15 cfm/ft.sq.
Dressing rooms		0.20 cfm/ft.sq.
Malls and arcades	20	0.20 cfm/ft.sq.
Shipping and receiving	10	0.15 cfm/ft.sq.
Smoking lounge <sup>11</sup>	70	60
Warehouses	5	0.05 cfm/ft.sq.
<b>Specialty Shops</b>		
Barber	25	15
Beauty	25	25
Reducing salons	20	15
Florists <sup>13</sup>	8	15
Clothiers, furniture		0.30 cfm/ft.sq.
Hardware, drugs, fabric	8	15
Supermarkets	8	15
Pet shops		1.00 cfm/ft.sq.
<b>Sports and Amusement<sup>14</sup></b>		
Spectator areas	150	15
Game rooms	70	25
Ice arenas (playing areas)		0.50 cfm/ft.sq.
Swimming Pools (pool and deck area) <sup>15</sup>		0.50 cfm/ft.sq.
Playing floor (gymnasium)	30	20
Ballrooms and discos	100	25

Application	Estimated Maximum <sup>2</sup> Occupancy P/1000 ft <sup>2</sup> or 100 m <sup>2</sup>	Outdoor Air Requirements cfm/person
Bowling alleys (seating areas)	70	25
Theaters <sup>16</sup>		
Ticket booths	60	20
Lobbies	150	20
Auditorium	150	20
Stages, studios	70	15
Transportation <sup>17</sup>		
Waiting rooms	100	15
Platforms	100	15
Vehicles	150	15
Workrooms		
Meat processing <sup>18</sup>	10	15
Photo studios	10	15
Darkrooms	10	0.50 cfm/ft.sq.
Pharmacy	20	15
Bank vaults	5	15
Duplicating, printing <sup>19</sup>		0.50 cfm/ft.sq.
INSTITUTIONAL FACILITIES		
Education		
Classroom	50	15
Laboratories <sup>20</sup>	30	20
Training shop	30	20
Music rooms	50	15
Libraries	20	15
Locker rooms		0.50 cfm/ft.sq.
Corridors		0.10 cfm/ft.sq.
Auditoriums	150	15
Smoking lounges <sup>11</sup>	70	60
Hospitals, Nursing and Convalescent Homes		
Patient rooms <sup>21</sup>	10	25
Medical procedure	20	15
Operating rooms	20	30
Recovery and ICU	20	15
Autopsy rooms <sup>22</sup>		0.50 cfm/ft.sq.
Physical Therapy	20	15
Correctional Facilities		
Cells	20	20
Dining halls	100	15
Guard station	40	15

- Derived from ASHRAE Standard 62-1989.
- Net occupiable space.
- Dry-cleaning process may require more air.
- Supplementary smoke-removal equipment may be required.
- Distribution among people must consider worker location and concentration of running engine; stands where engines are run must incorporate systems for positive engine exhaust withdrawal. Contaminant sensors may be used to control ventilation.
- Independent of room size.
- Installed capacity for intermittent use.
- See also food and beverage service, merchandising, barber and beauty shops, garages.
- Some office equipment may require local exhaust.
- Mechanical exhaust with no recirculation is recommended.
- Normally supplied by transfer air, local mechanical exhaust; with no recirculation recommended.
- Normally supplied by transfer air.
- Ventilation to optimize plant growth may dictate requirements.
- When internal combustion engines are operated for maintenance of playing surfaces, increased ventilation rates may be required.
- Higher values may be required for humidity control.
- Special ventilation will be needed to eliminate special stage effects.
- Ventilation within vehicles may require special considerations.
- Spaces maintained at low temperatures (-10°F. to + 50°F.) are not covered by these requirements unless the occupancy is continuous. Ventilation from adjoining spaces is permissible. When the occupancy is intermittent, infiltration will normally exceed the ventilation requirements.
- Installed equipment must incorporate positive exhaust and control of undesirable contaminants.

- Special contamination control systems may be required for processes or functions including laboratory animal occupancy.
- Special requirements or codes and pressure relationships may determine minimum ventilation rates and filter efficiency. Procedures generating contaminants may require higher rates.
- Air shall not be recirculated into other spaces.
- Makeup air for hood exhaust may require more ventilating air.
- Occupant loading shall be based on the number of bedrooms as follows: first bedroom, two persons; each additional bedroom, one person. Where higher occupant loadings are known, they shall be used.

TABLE 3-5  
Prescriptive Integrated Forced Air Supply Duct Sizing

Required Flow (CFM) Per Table 3-2	Minimum Smooth Duct Diameter	Minimum Flexible Duct Diameter	Maximum Length <sup>1</sup>	Maximum Number of Elbows <sup>2</sup>
50-80	6"	7"	20'	3
80-125	7"	8"	20'	3
115-175	8"	10"	20'	3
170-240	9"	11"	20'	3

- For lengths over 20 feet increase duct diameter 1 inch.
- For elbows numbering more than 3 increase duct diameter 1 inch.

TABLE 3-6  
Prescriptive Supply Fan Duct Sizing

Supply Fan Tested CFM At 0.4" WG		
Specified volume from Table 3-2	Minimum Smooth Duct Diameter	Minimum Flexible Duct Diameter
50-90 CFM	4 inch	5 inch
90-150 CFM	5 inch	6 inch
150-250 CFM	6 inch	7 inch
250-400 CFM	7 inch	8 inch

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-095, § 51-13-304, filed 12/19/06, effective 7/1/07; 04-07-192, § 51-13-304, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190, 19.27.020. 01-02-099, § 51-13-304, filed 1/3/01, effective 7/1/01. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-304, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-304, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-304, filed 12/18/90, effective 7/1/91.]

#### WAC 51-13-400 Chapter 4—Indoor air quality.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-400, filed 12/18/90, effective 7/1/91.]

#### WAC 51-13-401 Pollutant source control.

401.1 Formaldehyde Reduction Measures: All structural panel components within the conditioned space such as plywood, particle board, wafer board, and oriented strand board shall be identified as "EXPOSURE 1," "EXTERIOR" or "HUD-APPROVED."

[Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-401, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-401, filed 12/18/90, effective 7/1/91.]

#### WAC 51-13-402 Solid fuel burning appliances and fireplaces.

402.1 General: Solid fuel burning appliances and fireplaces shall satisfy one of the following criteria.

402.2 Solid Fuel Burning Appliances: Solid fuel burning appliances shall be provided with the following:

a) Tight fitting metal or ceramic glass doors.

b) 1. A source from outside the structure of primary combustion air, connected to the appliance as per manufacturer's specification. The air inlet shall originate at a point below the fire box. The duct shall be 4 inches or greater in diameter, not exceed 20 feet in length, and be installed as per manufacturer's instructions;

or

2. The appliance and manufacturer's recommended combustion air supply, as an installed unit, shall be certified by an independent testing laboratory to have passed Test No. 11 - Negative Pressure Test, Section 12.3, of ULC S627-M1984 "Space Heaters for Use with Solid Fuels," modified as follows:

A) Negative pressure of 8 Pascal shall be initially established with the chamber sealed and the air supply, if not directly connected to the appliance, closed off.

B) The air supply, if not directly connected to the appliance, shall then be opened.

C) The maximum allowable air exchange rate from chamber leakage and intentional air supply for the unit (appliance with combustion air supply) in the test chamber is 3.5 air changes per hour, or 28 cfm (cubic feet of air per minute), whichever is less.

EXCEPTION: Combustion air may be supplied to the room in which the solid fuel burning appliance is located in lieu of direct ducting, provided that one of the following conditions is met:

- 1) The solid fuel burning appliance is part of a central heating plant and installed in an unconditioned space in conformance with the International Mechanical Code; or
- 2) The solid fuel burning appliance is installed in existing construction directly on a concrete floor or surrounded by masonry materials as in a fireplace.

The combustion air terminus shall be located as close to the solid fuel burning appliance as possible and shall be provided with a barometric damper or equivalent. The combustion air source shall be specified by the manufacturer or no less than four (4) inches in diameter or the equivalent in area or as approved.

402.3 Fireplaces: Fireplaces shall be provided with each of the following:

a) Tightly fitting flue dampers, operated by a readily accessible manual or approved automatic control.

EXCEPTION: Fireplaces with gas logs shall be installed in accordance with the International Mechanical Code section 901, except that the standards for liquefied petroleum gas installations shall be NFPA 58 (Liquefied Petroleum Gas Code) and NFPA 54 (National Fuel Gas Code).

b) An outside source for combustion air ducted into the firebox. The duct shall be at least six (6) square inches, and shall be provided with an operable outside air duct damper.

EXCEPTION: Washington certified fireplaces shall be installed with the combustion air systems necessary for their safe

and efficient combustion and specified by the manufacturer in accordance with the Washington state building code standard 31-2 (WAC 51-50-31200) and International Building Code Section 2114 (WAC 51-50-2114).

c) Site built fireplaces shall have tight fitting glass or metal doors, or a flue draft induction fan, or as approved for minimizing back-drafting. Factory built fireplaces shall use doors listed for the installed appliance.

402.4 Masonry Heaters: Masonry heaters shall be approved by the department of ecology and shall contain both of the following:

a) Primary combustion air ducted from the outside of the structure to the appliance.

b) Tight fitting ceramic glass or metal doors. Flue damper, when provided, shall have an external control and when in the closed position shall have a net free area of not less than five percent of the flue cross sectional area.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-402, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190 and 19.27.020. 98-02-047, § 51-13-402, filed 1/5/98, effective 7/1/98. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-402, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-402, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-402, filed 12/18/90, effective 7/1/91.]

## **WAC 51-13-500 Chapter 5—Radon resistive construction standards.**

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-500, filed 12/18/90, effective 7/1/91.]

### **WAC 51-13-501 Scope.**

501.1 General: The criteria of this chapter establishes minimum radon resistive construction requirements for all Group R Occupancies. These requirements are adopted pursuant to the ventilation requirements of Section 7, of Chapter 2 of the Session Laws of 1990.

501.2 Application: The requirements of this chapter shall be adopted and enforced by all jurisdictions of the state according to the following subsections:

501.2.1: All jurisdictions of the state shall comply with section 502.

501.2.2: Clark, Ferry, Okanogan, Pend Oreille, Skamania, Spokane, and Stevens counties shall also comply with section 503.

[Statutory Authority: RCW 19.27.190 and 19.27.020 and Chapters 19.27 and 34.05 RCW. 07-01-095, § 51-13-501, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-501, filed 12/21/94, effective 6/30/95; 91-01-102, § 51-13-501, filed 12/18/90, effective 7/1/91.]

### **WAC 51-13-502 Statewide radon requirements.**

#### **502.1 Crawlspace:**

502.1.1 General: All crawlspaces shall comply with the requirements of this section.

502.1.2 Ventilation: All crawlspaces shall be ventilated as specified in section 1203.3 of the International Building Code (chapter 51-50 WAC).

If the installed ventilation in a crawlspace is less than one square foot for each three hundred square feet of crawlspace area, or if the crawlspace vents are equipped with operable louvers, a radon vent shall be installed to originate from a point between the ground cover and soil. The radon vent shall be installed in accordance with sections 503.2.6 and 503.2.7.

502.1.3 Crawlspace Plenum Systems: In crawlspace plenum systems used for providing supply air for an HVAC system, aggregate, a permanently sealed soil gas retarder membrane and a radon vent pipe shall be installed in accordance with section 503.2. Crawlspaces shall not be used for return air plenums.

In addition, an operable radon vent fan shall be installed. The fan shall be located as specified in section 503.2.7. The fan shall be capable of providing at least one hundred cfm at one inch water column static pressure. The fan shall be controlled by a readily accessible manual switch. The switch shall be labeled "RADON VENT FAN."

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-502, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190 and 19.27.020. 98-02-047, § 51-13-502, filed 1/5/98, effective 7/1/98. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-502, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-502, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-12-045, § 51-13-502, filed 6/5/91, effective 7/1/91; 91-01-102, § 51-13-502, filed 12/18/90, effective 7/1/91.]

### **WAC 51-13-503 Radon prescriptive requirements.**

503.1 Scope: This section applies to those counties specified in section 501.2.2. This section establishes prescriptive construction requirements for reducing the potential for radon entry into all Group R Occupancies, and for preparing the building for future mitigation if desired.

In all crawlspaces, except crawlspace plenums used for providing supply air for an HVAC system, a continuous air barrier shall be installed between the crawlspace area and the occupied area to limit air transport between the areas. If a wood sheet subfloor or other material is utilized as an air barrier, in addition to the requirements of section 502.1.6.2 of the Washington state energy code, all joints between sheets shall be sealed.

#### **503.2 Floors in Contact with the Earth**

503.2.1 General: Concrete slabs that are in direct contact with the building envelope shall comply with the requirements of this section.

EXCEPTION: Concrete slabs located under garages or other than Group R Occupancies need not comply with this chapter.

503.2.2 Aggregate: A layer of aggregate of four inch minimum thickness shall be placed beneath concrete slabs. The aggregate shall be continuous to the extent practical.

503.2.3 Gradation: Aggregate shall:

a) Comply with ASTM Standard C-33 Standard Specification for Concrete Aggregate and shall be size No. 8 or larger size aggregate as listed in Table 2, Grading Requirements for Coarse Aggregate; or

b) Meet the 1988 Washington State Department of Transportation specification 9-03.1 (3) "Coarse Aggregate for Portland Cement Concrete," or any equivalent successor standards. Aggregate size shall be of Grade 8 or larger as listed in section 9-03.1 (3) C, "Grading"; or

c) Be screened, washed pea gravel free of deleterious substances in a manner consistent with ASTM Standard C-33 with one hundred percent (100%) passing a one-half (1/2) inch sieve and less than five percent (5%) passing a No. 16 sieve. Sieve characteristics shall conform to those acceptable under ASTM Standard C-33.

EXCEPTION: Aggregate shall not be required if a substitute material or system, with sufficient load bearing characteristics, and having approved capability to provide equal or superior air flow, is installed.

503.2.4 Soil-Gas Retarder Membrane: A soil-gas retarder membrane, consisting of at least one layer of virgin polyethylene with a thickness of at least six mil, or equivalent flexible sheet material, shall be either placed directly under all concrete slabs so that the slab is in direct contact with the membrane, or on top of the aggregate with two inches (2") minimum of fine sand or pea gravel installed between the concrete slab and membrane. The flexible sheet shall extend to the foundation wall or to the outside edge of the monolithic slab. Seams shall overlap at least twelve inches. The membrane shall also be fitted tightly to all pipes, wires, and other penetrations of the membrane and sealed with an approved sealant or tape. All punctures or tears shall be repaired with the same or approved material and similarly lapped and sealed.

503.2.5 Sealing of Penetrations and Joints: All penetrations and joints in concrete slabs or other floor systems and walls below grade shall be sealed by an approved sealant to create an air barrier to limit the movement of soil-gas into the indoor air.

Sealants shall be approved by the manufacturer for the intended purpose. Sealant joints shall conform to manufacturer's specifications. The sealant shall be placed and tooled in accordance with manufacturer's specifications. There shall be no gaps or voids after the sealant has cured.

503.2.6 Radon Vent: One continuous sealed pipe shall run from a point within the aggregate under each concrete slab to a point outside the building. Joints and connections shall be permanently gas tight. The continuous sealed pipe shall interface with the aggregate in the following manner, or by other approved equal method: The pipe shall be permanently connected to a "T" within the aggregate area so that the two end openings of the "T" lie within the aggregate area. A minimum of five feet of perforated drain pipe of three inches minimum diameter shall join to and extend from the "T."

The perforated pipe shall remain in the aggregate area and shall not be capped at the ends. The "T" and its perforated pipe extensions shall be located at least five feet horizontally from the exterior perimeter of the aggregate area.



The continuous sealed pipe shall terminate no less than twelve inches above the eave, and more than ten horizontal feet from a woodstove or fireplace chimney, or operable window. The continuous sealed pipe shall be labeled "radon vent." The label shall be placed so as to remain visible to an occupant.

The minimum pipe diameter shall be three inches unless otherwise approved. Acceptable sealed plastic pipe shall be smooth walled, and may include either PVC schedule 40 or ABS schedule of equivalent wall thickness.

The entire sealed pipe system shall be sloped to drain to the sub-slab aggregate.

The sealed pipe system may pass through an unconditioned attic before exiting the building; but to the extent practicable, the sealed pipe shall be located inside the thermal envelope of the building in order to enhance passive stack venting.

EXCEPTION: A fan forced sub-slab depressurization system includes:

- 1) Soil-gas retarder membrane as specified in section 503.2.4;
- 2) Sealing of penetrations and joints as specified in section 503.2.5;
- 3) A three-inch continuous sealed radon pipe shall run from a point within the aggregate under each concrete slab to a point outside the building;
- 4) Joints and connections shall be gas tight, and may be of either PVC schedule 40 or ABS schedule of equivalent in wall thickness;
- 5) A label of "radon vent" shall be placed on the pipe so as to remain visible to the occupant;
- 6) Fan circuit and wiring as specified in section 503.2.7 and a fan.

If the sub-slab depressurization system is exhausted through the concrete foundation wall or rim joist, the exhaust terminus shall be a minimum of six feet from operable windows or outdoor air intake vents and shall be directed away from operable windows and outdoor air intake vents to prevent radon re-entrainment.

**503.2.7 Fan Circuit and Wiring and Location:** An area for location of an in-line fan shall be provided. The location shall be as close as practicable to the radon vent pipe's point of exit from the building, or shall be outside the building shell; and shall be located so that the fan and all downstream piping is isolated from the indoor air.

Provisions shall be made to allow future activation of an in-line fan on the radon vent pipe without the need to place new wiring. A one hundred ten volt power supply shall be provided at a junction box near the fan location.

**503.2.8 Separate Aggregate Areas:** If the four-inch aggregate area underneath the concrete slab is not continuous, but is separated into distinct isolated aggregate areas by a footing or other barrier, a minimum of one radon vent pipe shall be installed into each separate aggregate area.

EXCEPTION: Separate aggregate areas may be considered a single area if a minimum three-inch diameter connection joining the separate areas is provided for every thirty feet of barrier separating those areas.

**503.2.9 Concrete Block Walls:** Concrete block walls connected to below grade areas shall be considered unsealed

surfaces. All openings in concrete block walls that will not remain accessible upon completion of the building shall be sealed at both vertical and horizontal surfaces, in order to create a continuous air barrier to limit the transport of soil-gas into the indoor air.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-503, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190, 19.27.020. 01-02-099, § 51-13-503, filed 1/3/01, effective 7/1/01. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-503, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-503, filed 12/18/90, effective 7/1/91.]

## Chapter 51-16 WAC

### STATE BUILDING CODE GUIDELINES

#### WAC

51-16-010	Authority.
51-16-020	Purpose.
51-16-030	Exemptions for indigent housing guidelines.
51-16-080	Permit exemptions guideline.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

51-16-040	Uniform Mechanical Code. [Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-040, filed 12/1/88, effective 7/1/89. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-040, filed 11/26/85, effective 6/11/86.] Repealed by 92-01-069, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139.
51-16-050	Uniform Fire Code and Uniform Fire Code Standards. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-16-050, filed 1/3/90, effective 7/1/90. Statutory Authority: RCW 19.27.074. 88-24-018 and 89-11-081 (Orders 88-11 and 88-11A), § 51-16-050, filed 12/1/88 and 5/23/89, effective 7/1/89. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-050, filed 11/26/85, effective 6/11/86.] Repealed by 92-01-069, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139.
51-16-060	Uniform Plumbing Code and Uniform Plumbing Code standards. [Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-060, filed 12/1/88, effective 7/1/89; 86-24-041 (Order 86-19), § 51-16-060, filed 11/26/86, effective 4/27/87. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-060, filed 11/26/85, effective 6/11/86.] Repealed by 92-01-069, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139.
51-16-070	Exceptions. [Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-070, filed 12/1/88, effective 7/1/89. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-070, filed 11/26/85, effective 6/11/86.] Repealed by 92-01-069, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139.
51-16-090	Submittal of proposed city or county amendments. [Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-090, filed 12/1/88, effective 7/1/89. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-090, filed 11/26/85, effective 6/11/86.] Repealed by 90-13-033, filed 6/13/90, effective 7/23/90. Statutory Authority: RCW 19.27.060 (7)(b).
51-16-100	Review of city and county amendments previously approved by the council. [Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-100, filed 12/1/88, effective 7/1/89.] Repealed by 92-01-069, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139.

**WAC 51-16-010 Authority.** These guidelines are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139. 92-01-069, § 51-16-010, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-010, filed 12/1/88, effective 7/1/89. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-010, filed 11/26/85, effective 6/11/86.]

**WAC 51-16-020 Purpose.** The purpose of these guidelines is to provide local governments with amendatory language for specific applications. The guidelines are not required to be adopted and enforced by local governments.

[Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139. 92-01-069, § 51-16-020, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-020, filed 12/1/88, effective 7/1/89. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-020, filed 11/26/85, effective 6/11/86.]

**WAC 51-16-030 Exemptions for indigent housing guidelines.** Cities and counties are permitted the option of adopting exemptions from the state building code requirements for buildings whose character of use or occupancy has been changed in order to provide housing for indigent persons. The adoption of an ordinance or resolution by cities and counties for the purpose to provide for occupancy exemptions for indigent housing as outlined in this section, shall not be considered a local government residential amendment requiring approval by the state building code council.

The guideline shall read as follows:

The character of use or occupancy of an existing building located in this state, may be changed in order to provide housing for indigent persons, without conforming to all of the requirements of the State Building Code provided that:

1. The building official has reviewed and approved the proposed exemption; and,
2. The proposed housing for indigent persons is less hazardous than the existing use; and,
3. Any code deficiencies exempted pose no threat to human life, health, or safety; and,
4. The building or buildings exempted are owned or administered by a public agency or nonprofit corporation; and,
5. The exemption is authorized for no more than five years, subject to renewal of the exemption by the building official.

[Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139. 92-01-069, § 51-16-030, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.020 and 19.27.074. 91-01-117, § 51-16-030, filed 12/19/90, effective 7/1/91. Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-16-030, filed 1/3/90, effective 7/1/90. Statutory Authority: RCW 19.27.074. 88-24-018 and 89-11-081 (Orders 88-11 and 88-11A), § 51-16-030, filed 12/1/88 and 5/23/89, effective 7/1/89. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-030, filed 11/26/85, effective 6/11/86.]

**WAC 51-16-080 Permit exemptions guideline.** Cities and counties are permitted the option of adopting a one thousand five hundred dollar building permit exemption for certain construction and alteration activities for Group R, Division 3 and Group M, Division 1 Occupancies. To adopt the permit exemption guideline, the following section of the 1991 Uniform Building Code shall be amended as follows:

(1) Section 301(b) of the Uniform Building Code shall be amended to read as follows:

(2007 Ed.)

(b) Exempted work. A building permit shall not be required for the following:

1. One-story detached accessory buildings used as tool and storage sheds, playhouses and similar uses, provided the projected roof area does not exceed one hundred twenty square feet.

2. Fences not over six feet high.

3. Oil derricks.

4. Movable cases, counters, and partitions not over five feet nine inches high.

5. Retaining walls which are not over four feet in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II, or III-A liquids.

6. Water tanks supported directly upon grade if the capacity does not exceed five thousand gallons and the ratio of height to diameter or width does not exceed two to one.

7. Platforms, walks, and driveways not more than thirty inches above grade and not over any basement or story below.

8. Painting, papering, and similar finish work.

9. Temporary motion picture, television, and theater stage sets and scenery.

10. Window awnings supported by an exterior wall of Group R, Division 3, and Group M Occupancies when projecting not more than fifty-four inches.

11. Prefabricated swimming pools accessory to a Group R, Division 3 Occupancy in which the pool walls are entirely above the adjacent grade and if the capacity does not exceed five thousand gallons.

12. Minor construction and alteration activities to Group R, Division 3 and Group M, Division 1 Occupancies, as determined by the building official, which the total valuation, as determined in Section 304(b) or as documented by the applicant to the satisfaction of the building official, does not exceed one thousand five hundred dollars in any twelve-month period: Provided, That the construction and/or alteration activity does not affect any structural components, or reduce existing egress, light, air, and ventilation conditions. This exemption does not include electrical, plumbing, or mechanical activities. The permit exemption shall not otherwise exempt the construction or alteration from the substantive standards of the codes enumerated in RCW 19.27.031, as amended and maintained by the state building code council under RCW 19.27.070.

Unless otherwise exempted, separate plumbing, electrical, and mechanical permits will be required for the above exempted items.

Exemption from the permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction.

The adoption of an ordinance or resolution by cities and counties for the purpose to provide for a permit exemption as outlined in this section, shall not be considered a local government residential amendment requiring approval by the state building code council.

[Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139. 92-01-069, § 51-16-080, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.060 (7)(b). 90-13-033, § 51-16-080, filed 6/13/90, effective 7/23/90. Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), §

51-16-080, filed 12/1/88, effective 7/1/89. Statutory Authority: 1985 c 360.  
85-24-029 (Order 85-13), § 51-16-080, filed 11/26/85, effective 6/11/86.]

## PART I TITLE AND SCOPE

### Chapter 51-19 WAC WASHINGTON STATE HISTORIC BUILDING CODE WAC

#### PART I TITLE AND SCOPE

51-19-100	Title.
51-19-110	Purpose.
51-19-120	Scope.
51-19-130	Existing uses.
51-19-140	Additions, alterations, and repairs.
51-19-150	Change of occupancy.
51-19-160	Maintenance.
51-19-170	Alternative materials, designs, and methods.
51-19-180	Modifications.
51-19-190	Tests.

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51-19-260	Liability.
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51-19-300	Definitions.
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51-19-400	General.
51-19-410	Exit systems.
51-19-420	Structural safety.
51-19-430	Weather protection.
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51-19-500	Survey or evaluation.
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51-19-600	General.
51-19-610	Heights and area.
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51-19-670	Roof coverings.

#### PART VII ACCESSIBILITY TO PERSONS WITH DISABILITIES

51-19-700	General.
51-19-710	Building access and use.

#### PART VIII ENERGY CONSERVATION

51-19-800	General.
51-19-810	Alternative energy conservation provisions.

#### PART IX APPENDICES

51-19-900	Appendix A.
51-19-901	Appendix B—Bibliography.

**WAC 51-19-100 Title.** This code shall be known as the Washington State Historic Building Code, hereinafter referred to as the HBC.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-100, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-110 Purpose.** It is the purpose of the HBC to provide regulations, as prescribed in RCW 19.27.120(2), providing alternatives, when authorized by the appropriate building official, to conformance to all the requirements of the codes adopted under RCW 19.27.031, for repairs, alterations, and additions necessary for the preservation, restoration and related reconstruction, rehabilitation, strengthening, or relocation of buildings or structures designated as historic buildings, in accordance with RCW 19.27.120(1). Such regulations are intended to preserve original, or restored architectural elements and features, to encourage energy conservation, barrier-free access and a cost-effective approach to preservation, and to provide a historic building or structure that will be less hazardous, based on accepted life and fire safety practices, than the existing building. These regulations, when authorized by the appropriate building official, control and allow alternatives to any and all codes enumerated in RCW 19.27.031 when dealing with historic buildings or sites.

The purpose of this code is not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by the terms of this code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-110, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-120 Scope.** The provisions of the HBC shall constitute the minimum standards for the preservation, restoration and related reconstruction, rehabilitation, strengthening, or relocation of buildings or structures, changes of occupancy and alteration or repair of historic buildings. Whenever reference is made to an appendix in this code, the provisions of the appendix shall not apply unless specifically adopted.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-120, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-130 Existing uses.** Historic buildings may have their existing use or occupancy continued if such use or occupancy was legal at the time of the adoption of the HBC, provided such continued use is not dangerous to life and that subsequently adopted regulations specifically applicable to historic buildings or structures are satisfied.

Nothing in the HBC shall be construed to allow the degradation of those systems, devices and equipment required by the prevailing codes under which the building was constructed.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-130, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-140 Additions, alterations, and repairs.** Buildings and structures to which additions, alterations, or

repairs are made shall comply with all the requirements of the Building Code for new construction except as specifically provided in the HBC. Additions, alterations, or repairs may be made to any building or structure without requiring the historic building or structure to comply with all the requirements of the Building Code, provided:

- (1) Additions shall conform to the requirements for a new building or structure.
- (2) Additions, alterations, or repairs shall not cause a historic building or structure to become unsafe or overloaded.
- (3) New additions shall not add to or cause a historic building to exceed the height, number of stories, or area specified for new buildings.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-140, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-150 Change of occupancy.** Any change in the use or occupancy of a historic building or structure shall comply with the provisions of the HBC. Any building which involves a change in use or occupancy shall not exceed the height, number of stories, and area permitted for new buildings, except as permitted in the HBC and local ordinances.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-150, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-160 Maintenance.** All buildings and structures and all parts thereof shall be maintained in a safe and sanitary condition. All systems, devices, or safeguards which were required by the prevailing codes under which the building was constructed shall be maintained in conformance with the requirements of the HBC. The owner or the owner's designated agent shall be responsible for the maintenance of buildings and structures. To determine compliance with this section, the building official may cause any structure to be reinspected.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-160, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-170 Alternative materials, designs, and methods.** The provisions of this code are not intended to prevent the use of any material, design, or method of construction not specifically prescribed by the HBC, provided any alternate has been approved and its use authorized by the building official.

The building official may approve any such alternate, provided the building official finds that the proposed design is satisfactory and complies with the provisions of the HBC and that the material and method of work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in suitability, strength, effectiveness, fire resistance, durability, safety, and sanitation.

The building official shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding use of an alternate. The details of any action granting approval of an alternate shall be recorded and entered in the files of the code enforcement agency.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-170, filed 12/18/90, effective 7/1/91.]

(2007 Ed.)

**WAC 51-19-180 Modifications.** Whenever there are practical difficulties involved in carrying out the provisions of the HBC, the building official may accept compliance alternatives or grant modifications for individual cases, provided the building official shall first find that a significant reason makes the strict letter of the HBC impractical and that the compliance alternative or modification is in conformity with the intent and purpose of the HBC and that such compliance alternative or modification does not lessen health, life-safety, and the intent of any fire-safety requirements or any degree of structural integrity. The details of any action granting modifications or the acceptance of a compliance alternative shall be recorded and entered in the files of the code enforcement agency.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-180, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-190 Tests.** Whenever there is insufficient evidence of compliance with any of the provisions of the HBC or evidence that any material or construction does not conform to the requirements of the HBC, the building official may require tests as proof of compliance to be made at no expense to the jurisdiction.

Test methods shall be as specified by the HBC, the Building Code, or by other recognized test standards. If there are no recognized and accepted test methods for the proposed alternate, the building official shall determine test procedures.

All tests shall be made by an approved agency. Reports of such tests shall be retained by the building official for the period required for the retention of public records.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-190, filed 12/18/90, effective 7/1/91.]

## PART II ADMINISTRATION

**WAC 51-19-200 Enforcement.** The building official is hereby authorized to enforce the provisions of the HBC. The building official shall have the power to render interpretations of the HBC and to adopt and enforce rules and regulations supplemental to this code as may be deemed necessary in order to clarify the application of the provisions of the HBC. Such interpretations, rules, and regulations shall be in conformity with the intent and purpose of the HBC.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-200, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-210 Permits.** Buildings or structures regulated by the HBC shall not be enlarged, altered, repaired, improved, or converted unless a separate permit for each building or structure has been obtained from the building official in accordance with and in the manner prescribed in the Building Code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-210, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-220 Inspection.** All buildings or structures within the scope of this code and all construction or work for which a permit is required shall be subject to inspection by

the building official in accordance with and in the manner prescribed in the HBC and the Building Code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-220, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-230 Repairs.** Repairs to any portion of a historic building or structure may be made with original materials and original methods of construction, subject to provisions of the HBC.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-230, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-240 Relocated buildings.** Relocated historic buildings shall be considered a historic building for the purposes of the HBC. Relocated residential buildings in or within a county or city are not required to meet the full requirements of the Building Code, as prescribed in RCW 19.27.180, provided the occupancy classification of the building or structure is not changed as a result of the move. If an occupancy classification change occurs as a result of the move, the building or structure shall be reviewed under Part VI, Change of occupancy standards. Relocated historic buildings and structures shall be so sited that exterior wall and opening requirements comply with the Building Code or the compliance alternatives of the HBC. Foundations of relocated historic buildings and structures shall comply with the Building Code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-240, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-250 Right of entry.** Whenever necessary to make an inspection to enforce any of the provisions of the HBC, or whenever the building official or an authorized representative has reasonable cause to believe that there exists in any building or upon any premises any condition or code violation which makes such building or premises unsafe, dangerous or hazardous, the building official or an authorized representative may enter such building or premises at all reasonable times to inspect the same or to perform any duty imposed upon the building official by the HBC, provided that if such building or premises be occupied, proper credentials shall first be presented and entry requested; and if such building or premises be unoccupied, the official shall first make a reasonable effort to locate the owner or other persons having charge or control of the building or premises and request entry. If such entry is refused, the building official or an authorized representative shall have recourse to every remedy provided by law to secure entry.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-250, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-260 Liability.** The building official or an authorized representative charged with the enforcement of the HBC, acting in good faith and without malice in the discharge of the prescribed duties, shall not thereby render themselves liable for any damage that may accrue to persons or property as a result of any act or by reason of any act or omission in the discharge of those duties. Any suit brought against the building official or employee because of such act or omission performed in the enforcement of any provision of

the HBC shall be defended by the jurisdiction until final termination of such proceedings and any judgment resulting therefrom shall be assumed by the jurisdiction.

The HBC shall not be construed to relieve from or lessen the responsibility of any person owning, operating, or controlling any building or structure for any damages to persons or property caused by defects, nor shall the code enforcement agency or its parent jurisdiction be held as assuming any such liability by reason of the inspections authorized by the HBC or any permits or certificates issued under the HBC.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-260, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-270 Unsafe buildings or structures.** All buildings or structures regulated by the HBC which are structurally unsafe or not provided with adequate egress, or which constitute a fire hazard or are otherwise dangerous to human life are, for the purpose of this section, unsafe. Unsafe buildings shall comply with section 203 of the Building Code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-270, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-280 Appeals.** The board of appeals established under the Building Code shall have authority to provide for final interpretation of the provision of the HBC and to hear appeals.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-280, filed 12/18/90, effective 7/1/91.]

### PART III DEFINITIONS

**WAC 51-19-300 Definitions.** For the purpose of the HBC, certain terms, phrases, words, and their derivatives shall be construed as specified in this chapter. Words used in the singular include the plural and the plural the singular. Words used in the masculine gender include the feminine and the feminine the masculine.

Where terms are not defined, they shall have their ordinary accepted meanings within the context in which they are used. In the event there is a question about the definition of a term, the definitions for terms in the codes enumerated in RCW 19.27.031 and the edition of **Webster's Dictionary**, referenced therein shall be considered as the sources for providing ordinarily accepted meanings.

"Adaptive use" is the process of adapting a building to accomplish a use other than that for which it was designed; i.e., a piano factory being converted into housing, or a mansion into an office or apartments.

"Addition" is an extension or increase in floor area or height of a building or structure.

"Alter or alteration" is any change, addition, or modification in construction or occupancy.

"Approved agency" is an established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved by the building official.

"Building" is any structure used or intended for supporting or sheltering any use or occupancy. (See structure.)

"Building Code" is the Uniform Building Code, promulgated by the International Conference of Building Officials as adopted by the state building code council.

"Building official" is the officer or other designated authority charged with the administration and enforcement of the HBC, or a duly authorized representative.

"Building service equipment" refers to the plumbing, mechanical, electrical, and elevator equipment including piping, wiring, fixtures, and other accessories which provide sanitation, lighting, heating, ventilation, cooling, refrigeration, firefighting, and transportation facilities essential for the habitable occupancy of the building or structure for its designated use and occupancy.

"Certified local government" or "CLG" means the local government has been certified by the state historic preservation officer as having established its own historic preservation commission and a program meeting federal and state standards.

"Dangerous Building Code" is the code, adopted by this jurisdiction, which outlines the processes and procedures for the determination and abatement of dangerous buildings.

"Electrical Code" is the National Electrical Code, promulgated by the National Fire Protection Association, as adopted by the Washington state department of labor and industries, electrical section.

"Equivalency" is meeting the intent of the HBC by means other than those detailed in specific code provisions.

"Fire hazard" is any thing or act which increases or may cause an increase of the hazard or menace of fire to a greater degree than that customarily recognized as normal by persons in the public service regularly engaged in preventing, suppressing, or extinguishing fire; or which may obstruct, delay, hinder, or interfere with the operations of the fire department or the egress of occupants in the event of fire.

"Historic building" is any structure, collection of structures, and their associated sites, deemed of importance to the history, architecture, or culture of an area by an appropriate local, state, or federal governmental jurisdiction. Included shall be structures on official national, state, or local historic registers or official listings such as the National Register of Historic Places, the state register of historic places, state points of historical interest, and registers or listings of historical or architecturally significant sites, places, historic districts, or landmarks as adopted by a certified local government.

"Historic fabric" consists of the original materials and portions of the building intact when exposed or as they appeared and were used in the past.

"Historical aspects" are the particular features of the historic site, building, or structure that gives it its historic significance. Features may include but are not limited to one or more of the following: Historical background, noteworthy architecture, unique design, works of art, memorabilia, and artifacts.

"Imminent hazard" is a condition which could cause serious or life threatening injury or death at any time.

"Occupancy" is the purpose for which a building, or part thereof, is used or intended to be used.

"Original materials" are those portions of the structure's fabric that existed during the period deemed to be most architecturally and/or historically significant.

"Preservation" is the maintenance of the structure in its present condition or as originally constructed. Preservation aims at halting further deterioration and providing structural safety, but does not contemplate significant rebuilding. Preservation includes techniques of arresting or slowing the deterioration of a structure; improvement of structural conditions to make a structure safe, habitable, or otherwise useful; normal maintenance and minor repairs that do not change or adversely affect the fabric or appearance of a structure.

"Prevailing code" is the "regular building regulations" which governed the design and construction or alteration of historical buildings within the jurisdiction of the enforcing agency at the time of their construction.

"Reconstruction" is the process of rebuilding a nonextant structure or portion of a structure to its original appearance through archival and archeological investigation. Although parts of the original structure are sometimes included in the reconstruction, the process usually involves new construction materials.

"Rehabilitation" involves equipping the building or facility for an extended useful life with a minimum alteration of original construction or the process of returning a structure to a state of usefulness by repairs, alterations, or additions.

"Relocation" involves any structure or a portion of a structure that may be moved to a new location.

"Renovation" is to make sound again any structure involved under the various definitions hereunder by cleanup, repair, and replacement of deteriorated detail or structure.

"Repair" is the reconstruction, renovation, or renewal of any portion of a historic building for the purpose of its maintenance.

"Reproduction" is a duplication, copy, or close imitation of the original.

"Restoration" is the process of accurately recovering, by the removal of later work and the replacement of missing earlier work, the form and details of a structure, together with its setting, as it appeared at a particular period of time.

"Structure" is that which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-300, filed 12/18/90, effective 7/1/91.]

## **PART IV FIRE AND LIFE SAFETY STANDARDS**

**WAC 51-19-400 General.** Safety to life in historic buildings and structures shall meet the intent of the Building Code. The provisions of this section shall be deemed as meeting the intent of the Historic Building Code, provided that none of the fire and life-safety features required by the prevailing codes under which the building was constructed will be reduced below the level established by either the HBC or the equivalent provisions of the currently adopted Building Code, whichever is least stringent. Alterations or repairs to a historic building or structure which are nonstructural and do not adversely affect any structural member or any part of the building or structure having required fire resistance may be made with the same materials of which the building or structure is constructed. Fire resistive ratings of archaic materials

may be evaluated based upon the Guideline on Fire Ratings of Archaic Materials and Assemblies from Guideline 2 of the Uniform Code for Building Conservation.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-400, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-410 Exit systems.** (1) Exit system capacity and the arrangement of exits shall comply with the requirements of the Building Code. Exit systems shall comply with the provisions of subsections (1) through (5) of this section, or the provisions of the prevailing code under which the building was constructed, whichever is more stringent. If any provision of the HBC or the prevailing code under which a building was constructed is more stringent than the currently adopted Building Code, the exit system shall comply with the provision of the currently adopted Building Code.

(2) All elements of the exit system shall be of sufficient size, width, and arrangement to provide safe and adequate means of egress. Every required exit shall have access to a public way, directly or through yards, courts or similar spaces, and such access shall be permanently maintained clear of any obstruction which would impede exiting.

(3) Occupants of every floor above the first story and in basements shall have access to at least two separate exits. A fire escape shall not be substituted for a stairway which was required by the prevailing codes under which the building was constructed.

EXCEPTIONS:

- (a) In all occupancies, second stories with an occupant load of less than ten may have one exit.
- (b) Only one exit need be provided from the second story within an individual dwelling unit which has an occupant load of less than ten.
- (c) Two or more dwelling units on the second story may have access to only one common exit when the total occupant load does not exceed ten.
- (d) Floors and basements used exclusively for service of the building may have one exit. For the purposes of this exception, storage rooms, laundry rooms, maintenance offices, and similar uses shall not be considered as providing service to the building.
- (e) Basements within an individual dwelling unit having an occupant load of less than ten may have one exit.
- (f) Occupied roofs of Group R, Division 3 Occupancies may have one exit if such occupied areas are less than five hundred square feet and located no higher than immediately above the second story.

(4) Corridors serving as a part of the exit system which have an occupant load of thirty or more in a Group A, B, E, or H Occupancy or an occupant load of ten or more in a Group R, Division 1 or Group I Occupancy shall have walls and ceilings of not less than one hour fire resistive construction. Existing walls and ceilings surfaced with wood lath and plaster or one-half inch thick gypsum wallboard may be permitted in lieu of one hour fire resistive construction, provided the surfaces are in good condition.

Door openings into such corridors shall be protected by a tight fitting smoke and draft control assembly having a fire protection rating of not less than twenty minutes when such opening protection was required by the prevailing codes under which the building was constructed. Door closing devices, door gaskets, and other requirements imposed by the prevailing codes under which the building was constructed shall be maintained. When the building was constructed

under a code which did not require twenty minute smoke and draft control assemblies, doorway openings shall be protected by doors having a fire protection rating of not less than twenty minutes or by a minimum one and three-eighths inch thick, solid bonded, wood core door or an equivalent insulated steel door. In such case, the frames need not have a fire resistive time period. Doors shall be maintained self-closing or shall be automatic closing, self-latching by activation of a smoke detector.

Transoms and openings other than doors from corridors to rooms shall be protected as required by the Building Code. Existing transoms may be maintained if fixed in the closed position. When the code under which the building was constructed permitted unprotected transoms or other unprotected openings, other than doors, such transoms or openings shall be covered with a minimum of three-fourths-inch-thick plywood, one-half-inch-thick gypsum wallboard, fixed glazing listed and labeled for a fire protection rating of at least three-fourths hour or equivalent material on the room side. Openings with fixed wired glass set in steel frames are permitted in corridor walls and ceilings.

**EXCEPTION:**

Existing corridor walls, ceilings, and opening protection not in compliance with the above may be continued when the building is protected with an approved automatic sprinkler system throughout: Provided, That a draft gasket assembly on sound, solid, self-closing, self-latching doors at door openings is installed and that sealing, caulking, and duct penetrations shall have dampers in all one-hour rated exit corridors. Such sprinkler system may be supplied from the domestic water supply system, provided the system is of adequate pressure, capacity, and sizing for the combined domestic and sprinkler requirements.

(5) Every dwelling unit, guest room, or sleeping rooms shall have access directly to the outside or to a public corridor or exit balcony.

(6) Existing fire escapes complying with this section may be accepted by the building official as one of the required exits. The fire escape shall not be the primary or the only exit. Fire escapes shall not take the place of stairways required by the codes under which the building was constructed.

Fire escapes shall comply with the following:

(a) Access from a corridor shall not be through an intervening room.

**EXCEPTION:**

Access through an intervening room may be permitted if the intervening door is not lockable and an exit sign is installed above the door which will direct occupants to the fire escape.

(b) All openings in an exterior wall below or within ten feet, measured horizontally, of an existing fire escape serving a building over two stories in height shall be protected by fire assembly having a minimum three-fourths hour fire protection rating, and where operable be self-closing. When openings are located within a recess or vestibule, adjacent enclosure walls shall be of not less than one hour fire resistive construction.

(c) Egress from the building shall be by an opening having a minimum clear width and height of not less than twenty-nine inches. Such openings shall be openable from the inside without the use of a key or special knowledge or effort. The sill of an opening giving access to the fire escape

shall be not more than thirty inches above the floor of the building or balcony.

(d) Fire escape stairways and their balconies shall support their dead load plus a live load of not less than one hundred pounds per square foot or concentrated load of three hundred pounds placed anywhere on the balcony or stairway so as to produce the maximum stress conditions. The stairway shall have a pitch not to exceed sixty degrees from the horizontal and shall have a minimum width of eighteen inches. The stairway shall be provided with a top and intermediate railing on each side. Treads shall be not less than four inches in width and the rise between treads shall not exceed ten inches. All stairway and balcony railings shall support a horizontally applied force of not less than fifty pounds per lineal foot of railing or a concentrated load of two hundred pounds placed anywhere on the railing so as to produce the maximum stress conditions.

(e) Fire escape balconies shall be not less than forty-four inches in width with no floor opening greater than five-eighths inch in width except the stairway opening. Stairway openings in such balconies shall be not less than twenty-two inches by forty-four inches. The guardrail of each balcony shall be not less than thirty-six inches high with not more than nine inches between intermediate rails.

(f) Fire escapes shall extend to the roof or provide an approved gooseneck ladder between the top floor landing and the roof when serving buildings four or more stories in height having roofs with a slope not exceeding four in twelve. Such ladders shall be designed and connected to the building to withstand a horizontal force of one hundred pounds per lineal foot; each rung shall support a concentrated load of five hundred pounds placed anywhere on the rung so as to produce the maximum stress conditions. All ladders shall be at least fifteen inches in clear width, be located within twelve inches of the building, and shall be placed flatwise relative to the face of the building. Ladder rungs shall be three-quarters inch in diameter and shall be located ten inches to twelve inches on center. Openings for roof access ladders through cornices and similar projections shall have minimum dimensions of thirty inches by thirty-three inches.

(g) The lowest balcony shall be not more than eighteen feet from the ground. Fire escapes shall extend to the ground or be provided with counterbalanced stairs reaching to the ground.

(h) Fire escapes shall be kept clear and unobstructed at all times and maintained in good working order.

(i) The fire escape shall have a clearance from electrical service conductors as required by the Electrical Code.

(7) Existing winding or spiral stairways may serve as one exit from a building, provided that a complying handrail is located at the stair's outside perimeter. (See WAC 51-19-440.) A winding or spiral stairway may not be the principal exit when used in conjunction with a fire escape as a second exit. The width of a spiral or winding stair may be used in the calculation of provided exit width when in compliance with this section. Circular stairways complying with the Building Code shall be acceptable as an exit.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-410, filed 12/18/90, effective 7/1/91.]

(2007 Ed.)

**WAC 51-19-420 Structural safety.** A building or structure or its individual structural members that exceed the limits established by the Dangerous Buildings Code shall be replaced or strengthened in order that the building, structure, or individual structural members will comply with the requirements of the Building Code for new construction. Roofs, floors, walls, foundations, and all structural components of buildings or structures shall be capable of resisting the forces and loads for the occupancies intended, as specified in the prevailing codes under which the building was constructed or in chapter 23 of the Building Code, except for earthquake forces and loads. See Part V of this chapter for earthquake hazard reduction requirements.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-420, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-430 Weather protection.** (1) Every building shall provide weather protected shelter for the occupants against the elements and exclude dampness.

(2) The roof of every building or structure shall provide weather protection for the building. All devices which were provided or are required to prevent ponding or flooding or to convey the roof water shall be capable of fulfilling that purpose.

(3) All weather exposed surfaces of historic buildings or structures shall provide weather protection.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-430, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-440 Other safety features.** (1)(a) The largest tread run within any flight of stairs shall not exceed the smallest by more than three-eighths inch. The greatest riser height within any flight of stairs shall not exceed the smallest by more than three-eighths inch.

EXCEPTION: Existing spiral and circular stairs shall be exempt from the variance in tread size requirement.

(b) Every stairway shall have at least one handrail.

EXCEPTION: A handrail is not required for existing stairs having less than four risers.

Spiral and winding stairways shall have a handrail on the outside perimeter.

(2) All unenclosed floor and roof openings, open and glazed sides of stairways, landings and ramps, balconies or porches which are more than thirty inches above grade or floor below, and roofs used for other than service of the building shall be protected by a guardrail.

EXCEPTION: Guardrails need not be provided at the following locations:  
(a) On the loading side of loading docks.  
(b) On the auditorium side of a stage or enclosed platform.  
(c) On private stairways thirty inches or less in height.

Existing guardrails, other than guardrails located on the open side of a stairway, which are at least thirty-six inches in height shall be permitted to remain. Guardrails lower than thirty-six inches in height shall be augmented or corrected to raise their effective height to thirty-six inches. Guardrails for stairways, exclusive of their landings, may have a height which is not less than thirty inches measured above the nosing of treads.



The spacing between existing intermediate railings or openings in existing ornamental patterns in significant historical staircases may be accepted; otherwise the Building Code shall apply. Missing elements or members of a guardrail may be replaced in a manner which will preserve the historic appearance of the building or structure.

(3) The installation or replacement of glass shall be as required for new construction by the Building Code and the requirements for energy conservation in Part VIII of this code.

(4) All wires and equipment, and installations thereof, that convey electric current, in, on, or about buildings or structures shall be in strict conformity with chapter 19.28 RCW, the statutes of the state of Washington, and the rules issued by the Washington state department of labor and industries.

(5) Leaking drain or supply lines shall be repaired or replaced. All unsafe conditions shall be corrected. Any cross connections or siphonage between fixtures shall be corrected.

(6) Mechanical systems shall have any unsafe conditions corrected.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-440, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-450 Light, ventilation, sanitation, smoke detectors, and heating.** (1) For Group R Occupancies, light, ventilation, sanitation, smoke detectors, and heating shall meet the requirements of the Building Code.

(2) Skylights set at an angle of less than forty-five degrees from the horizontal plane shall be mounted at least four inches above the plane of the roof on a curb constructed of materials as required for the frame. Skylights may be installed in the plane of the roof when the roof slope is greater than forty-five degrees from horizontal.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-450, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-460 Plumbing.** All plumbing fixtures shall be connected to a sanitary sewer or to an approved private sewage disposal system. All plumbing fixtures shall be connected to an approved system of water supply and provided with hot and cold running water necessary for its normal operation. All plumbing fixtures shall be of an approved glazed earthenware type or of a similarly nonabsorbent material.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-460, filed 12/18/90, effective 7/1/91.]

## PART V EARTHQUAKE HAZARD REDUCTION

**WAC 51-19-500 Survey or evaluation.** When required by the building official a survey or evaluation shall be made by an architect or structural engineer licensed by the state to practice as such, who is knowledgeable in the earthquake resistant design of structures, regarding the structure's ability to resist the seismic loads prescribed by the Building Code requirements or by established alternate evaluation methodologies. Broad judgment may be exercised concerning the strength and performance of materials not recognized by the Building Code. Past historic records of the structure or simi-

lar structures may be used in the evaluation, including the effects of subsequent alterations. The capability of the structure to carry vertical and horizontal loads shall be evaluated. A complete, continuous and adequate stress path, including connections, from every part or portion of the structure to the ground shall be provided for the required vertical and horizontal forces.

Parapets and exterior decoration shall be investigated for conformance with the Building Code or evaluation methodologies and anchorage with the ability to resist seismic forces shall be required, except in the case where those parapets or decoration are judged to present no hazard to life safety.

A report shall be made of the findings of the survey and evaluation noting all deterioration of the existing structure and making recommendations for the repair of deterioration and for any reconstruction or strengthening which should be undertaken. Plans and specifications for the work done pursuant to the survey and evaluation prepared under this section shall be prepared under the responsible charge of an architect or structural engineer.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-500, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-510 Alternatives.** Alternative materials and methods of construction may be substituted for those otherwise required by the HBC or by the recommendations of the earthquake survey and evaluation provided the alternative methods are necessary to preserve historic materials or features and that such alternative methods provide satisfactorily for the purposes intended, or are reasonably equivalent to the prescribed methods in quality, strength, effectiveness, fire resistance, durability, and safety.

The building official may request that sufficient evidence be submitted to substantiate any claims made regarding such alternative materials, evaluation methodologies, and alternative methods of construction.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-510, filed 12/18/90, effective 7/1/91.]

## PART VI CHANGE OF OCCUPANCY STANDARDS

**WAC 51-19-600 General.** The character of the occupancy of historic buildings and structures may be changed, provided the requirements of this chapter are met. Where no specific requirements are included herein, the building or structure shall comply with the Building Code.

Every change of occupancy to a classification in a different group or different division of the same group shall require a new certificate of occupancy regardless of whether any alterations are required by the HBC.

If the building or portion thereof does not conform to the requirements of the HBC for the proposed occupancy group or division, the building or portion thereof shall be made to conform to the Building Code except as specified in the HBC. The building official may issue a new certificate of occupancy stating that the building complies with the HBC.

The relative degree of hazard between different occupancy groups or between divisions of the same group shall be as set forth in the hazard category classifications, Tables Nos. VI-1 through VI-5. A historic building may have its occu-

pancy changed to an occupancy within the same hazard group or to an occupancy in a lesser hazard group without complying with all of the provisions of this chapter. A historic building shall comply with the requirements of the Building Code, except as specified in this chapter, when a change in occupancy will place it in a higher hazard group or when the occupancy is changed to Group A, Division 1 or 2, Group E, H, or I.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-600, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-610 Heights and area.** Heights and areas of buildings and structures shall meet the requirements of the Building Code for the new occupancy.

Exception: Historic buildings exceeding the maximum allowable heights and areas permitted for new buildings may undergo a change of occupancy if the hazard level of the new occupancy is equal to or less than the existing hazard group as shown in Table No. VI-1.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-610, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-620 Fire safety.** (1) When a change of occupancy is made to a higher hazard group as shown in Table No. VI-1, all elements of the exit system shall comply with the requirements of the Building Code.

EXCEPTIONS: (a) Existing exit corridors and stairways meeting the requirements of Part IV of this chapter may be used.  
(b) Exit system elements may meet alternative compliance requirements as approved by the building official.

(2) Existing exit systems complying with Part IV shall be accepted if the occupancy change is to an equal or lesser hazard group when evaluated in accordance with Table No. VI-2.

(3) When a change of occupancy is made to a higher hazard group as shown in Table No. VI-3, occupancy separations shall be provided as specified in the Building Code. When approved by the building official, existing wood lath and plaster in good condition or one-half inch gypsum wall board may be accepted where a one hour occupancy separation is required.

(4)(a) Vertical shafts may be designed to meet the requirements of atriums as required by the Building Code or the requirements of this chapter.

(b) Interior stairways shall be enclosed as required by the Building Code when a change of occupancy is made to a higher hazard group as shown in Table No. VI-4.

EXCEPTIONS: (i) In other than Group I Occupancies, an enclosure will not be required for openings serving only one adjacent floor and not connected with corridors or stairways serving other floors.  
(ii) Existing stairways not enclosed need not be enclosed in a continuous vertical shaft if each story is separated from other stories by one hour fire resistive construction or approved wired glass set in steel frames and all exit corridors are sprinklered. The openings between the corridor and occupant space shall have at least one quick response sprinkler head above the openings on the tenant side, with a draft gasket assembly on sound, solid, self-closing doors. The sprinkler system may be supplied from the domestic water supply system, provided the system is of adequate pressure, capacity, and sizing for the combined domestic and sprinkler requirements.

(c) Interior shafts, including, but not limited to, elevator hoistways, service and utility shafts, shall be enclosed with a minimum of one-hour fire-resistive construction.

EXCEPTIONS: (i) Vertical openings, other than stairways, need not be enclosed if the entire building is provided with an approved automatic sprinkler system. The sprinkler system may be supplied from the domestic water supply system, provided the system is of adequate pressure, capacity, and sizing for the combined domestic and sprinkler requirements.  
(ii) Where one-hour fire-resistive floor construction is required, vertical shafts need not be enclosed when such shafts are blocked at every floor level by the installation of not less than two full inches of solid wood or equivalent construction.

(d) All openings into such shafts shall be protected by fire assemblies having a fire protection rating of not less than one hour and shall be maintained self-closing or shall be automatic closing by actuation of a smoke detector. All other openings shall be fire protected in an approved manner. Existing fusible link-type automatic door-closing devices may be permitted if the fusible link rating does not exceed one hundred thirty-five degrees.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-620, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-630 Property protection.** (1) Exterior walls shall have fire resistance and opening protection as set forth in the Building Code. This provision shall not apply to walls at right angles to the property line.

EXCEPTIONS: (a) Where a fire-resistive rating greater than two hours is required for a building of any type of construction, existing noncombustible exterior walls having a fire resistive rating equivalent to two hours as determined by the building official may be accepted, provided:  
(i) The building is classified as a Group A, Division 3; Group B, Division 1 or Group B, Division 2 Occupancy; and  
(ii) The building does not exceed three stories in height; or  
(iii) The building shall be of heavy timber construction, and does not exceed five stories in height. (The state Building Code council recommends the use of Guideline 2 of the Uniform Code for Building Conservation as reference in determining fire resistive rating equivalency.)  
(b) Existing exterior walls shall be accepted if the occupancy is changed to a hazard group which is equal to or less than the existing occupancy as defined in Table No. VI-4.

(2) New openings in exterior walls shall be protected as required by the Building Code. Existing, nonconforming openings shall be protected by fire assembly having a minimum three-fourth hour fire protection rating, and where operable be self-closing. When openings in the exterior walls are required to be protected due to distance from the property line, the sum of the area of such openings shall not exceed fifty percent of the total wall area in each story.

EXCEPTIONS: (a) Protected openings shall not be required for Group R, Division 1 Occupancies which do not exceed three stories in height and which are located not less than three feet from the property line.  
(b) Where opening protection is required, an automatic fire extinguishing system throughout may be substituted for opening protection.  
(c) Opening protection may be omitted when the change of occupancy is to an equal or lower hazard classification in accordance with Table No. VI-2.  
(d) The building shall be of heavy timber construction, and does not exceed five stories in height.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-630, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-640 Structural safety.** Buildings and structures shall meet the minimum level of performance for structural safety as specified in Parts IV and V of this chapter.

Historic buildings may undergo a change of occupancy if the hazard group is equal to or less than the existing occupancy as shown in Table No. VI-5. Buildings undergoing a change of occupancy to a more hazardous group shall meet the earthquake hazard reduction requirements of Part V of this chapter for the new occupancy.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-640, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-650 Light and ventilation.** When deemed necessary by the building official, light and ventilation shall comply with the requirements of the Building Code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-650, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-660 Flame spread reduction.** Where finish materials are required to have a flame-spread classification of Class III or better, existing nonconforming materials shall be surfaced with an approved fire retardant paint or finish.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-660, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-670 Roof coverings.** Regardless of occupancy group, roof covering materials not less than Class C shall be permitted where a fire retardant roof covering is required. Nonrated materials may be acceptable only where approved by the building official.

TABLE NO. VI-1

#### HEIGHTS AND AREAS HAZARD CATEGORIES AND CLASSIFICATIONS

Relative Hazard	Occupancy Classification*
1	A-1, H, I-3 (highest hazard group)
2	A-2, A-2.1, I-1, I-2
3	A-3, A-4, B, E, R-1
4	R-3, M (lowest hazard group)

\*See Table 5-A of the Building Code.

TABLE NO. VI-2

#### LIFE SAFETY AND EXITS HAZARD CATEGORIES AND CLASSIFICATIONS

Relative Hazard	Occupancy Classification*
1	A-1, A-2, A-2.1, E, I, H-1, H-2, H-3 and H-7 (highest hazard group)
2	A-3
3	R-1, R-3, B-2 dining and drinking establishments

[Title 51 WAC—p. 144]

Relative Hazard	Occupancy Classification*
4	B-2 all others, B-4, H other than H-1, H-2, H-3 and H-7
5	B-1, B-3
6	M (lowest hazard group)

\*See Table 5-A of the Building Code.

\*See Table 5-A of the Building Code.

TABLE NO. VI-3

#### OCCUPANCY SEPARATIONS HAZARD CATEGORIES AND CLASSIFICATIONS

Relative Hazard	Occupancy Classification*
1	B-1, H, I (highest hazard group)
2	A, B-2, B-3, B-4
3	E
4	R-1, M
5	R-3 (lowest hazard group)

TABLE NO. VI-4

#### EXPOSURE OF EXTERIOR WALLS AND STAIRWAY ENCLOSURES HAZARD CATEGORIES AND CLASSIFICATIONS

Relative Hazard	Occupancy Classification*
1	H (highest hazard group)
2	B-2 mercantile and warehouses
3	A, E, I
4	B-1, B-2 all others, R
5	B-4, M (lowest hazard group)

\*See Table 5-A of the Building Code.

TABLE NO. VI-5

#### EARTHQUAKE SAFETY HAZARD CATEGORIES AND CLASSIFICATIONS

Relative Hazard	Occupancy Classification*
1	A, E, I (highest hazard group)
2	R-1
3	B-3, B-4, H
4	B-1, B-2
5	R-3, M (lowest hazard group)

\*See Table 5-A of the Building Code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-670, filed 12/18/90, effective 7/1/91.]

## PART VII

### ACCESSIBILITY TO PERSONS WITH DISABILITIES

**WAC 51-19-700 General.** The HBC shall provide the standards for accessibility of historic buildings to persons with disabilities. The value of access to buildings, structures, and sites of historic and cultural significance can be best obtained by providing the greatest degree of access while pre-

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serving the historic or architectural features of a building. Where accessibility is required by chapter 51-10 WAC, such standards shall be incorporated as practical.

Code users may consult the appendix bibliography concerning accessibility designs in historic buildings. Appendix Table A- 901 is also provided to assist in application of the code.

Where additions are undertaken they shall incorporate useful accessible design features.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-700, filed 12/18/90, effective 7/1/91.]

#### **WAC 51-19-710 Building access and use.** (1) Entry.

At least one primary entrance to a historic building shall be usable by persons with disabilities. When the building official, building designer, and local or state preservation officer concur that adaptation of a primary entrance will have a detrimental impact on the aesthetic or historic context of the entrance, then the building official may accept a reasonable alternate public entrance. When access is provided by other than a primary entrance, the entrance access shall be clearly indicated by directional signs. Accessible parking shall be located so as to provide the closest practical distance to the accessible entrance.

##### (2) Ramps.

(a) General. The building official shall accept alternate ramp designs which comply with the HBC when it is determined that installation of a ramp having a slope which complies with chapter 51-10 WAC cannot be achieved.

(b) Slope. The slope of the ramp shall be not steeper than one vertical to nine horizontal for a horizontal length not to exceed twelve feet. Ramps which have a horizontal length which does not exceed two feet may have a slope not to exceed one vertical to six horizontal. Adequate warnings shall be posted indicating steepness where slopes exceed the requirements provided in the regulations for barrier-free facilities.

(3) Doors. Existing doorways which provide a net clear opening of not less than twenty-nine and one-half inches shall be deemed to meet the access requirements of this chapter.

(4) Changes in elevation. Changes in elevation of portions of buildings on accessible routes of travel shall be accessible by ramps or lifts consistent with the intent of the HBC.

(5) Toilet rooms. Where toilet facilities are provided, at least one such facility designed for use by persons with disabilities, shall be provided for each sex, or a separate facility usable by either sex located along an accessible route of travel. Alternate provisions providing substantially equivalent facilities shall comply with this code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-710, filed 12/18/90, effective 7/1/91.]

### **PART VIII ENERGY CONSERVATION**

**WAC 51-19-800 General.** Historic buildings shall comply with the energy conservation and ventilation and indoor air quality requirements of the Washington State Energy Code chapter 51-11 WAC and the Washington State

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Ventilation and Indoor Air Quality Code chapter 51-13 WAC. The building official may modify the specific requirements of the Energy Code for Historic Buildings and require in lieu thereof alternate requirements which will result in a reasonable degree of energy efficiency.

**EXCEPTIONS:** The historic elements of the following buildings and structures are exempt from the State Energy Code:  
- Totally preserved buildings used as historical exhibits.  
- Seasonal use buildings.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-800, filed 12/18/90, effective 7/1/91.]

#### **WAC 51-19-810 Alternative energy conservation provisions.** (1) General. The alternative energy conservation requirements as specified in this part may be applied to a historic building if approved by the building official. The building official may approve other alternatives designed to improve energy efficiency without loss of the historic fabric of the building.

(2) Building envelope requirements. Historic buildings shall meet the minimum thermal performance values specified in the energy code, or the alternative measures specified in this subsection.

(a) Attics. Where accessible, insulation shall be installed in the attic to the requirements of the Energy Code, or lesser levels to maintain adequate ventilation, to reduce condensation problems or to provide safety clearances around electrical wiring or utility systems.

Additional insulation with an integral vapor barrier shall not be installed on top of existing insulation. A vapor barrier shall not be installed between layers of insulation.

(b) Exterior walls. Accessible wall cavities where finishes are being disturbed by alteration or renovation work shall be insulated to the extent practical. If accessible, a vapor retarder shall be installed on the winter warm side of the insulation (facing the conditioned space). An approved vapor retarding paint or clear finish is an acceptable vapor retarder.

Permeable materials on the exterior side of the cavity (or unheated side) or an air space or means of venting framing cavities to the exterior are required if insulation is added to the cavities in wood frame construction.

(c) Doors. Doors which are not of the original material or which are not replicas designed to be compatible with the historic aspects of the structure shall conform to the requirements of the Energy Code.

(d) Floors over crawl spaces. If accessible, adequately ventilated, and with ground clearance in conformance with Building Code requirements, insulation with an R-value of eleven or greater shall be installed in floors of unheated crawl spaces.

(e) Moisture control in crawl spaces. Minimum foundation ventilation shall be provided in unheated crawl spaces. The net-free area of ventilation shall be at least 1/300th of the floor area. The vents shall be distributed around the perimeter of the foundation as equally as practical to provide adequate cross-ventilation. If accessible, a black polyethylene vapor barrier shall be applied to cover the exposed earth as prescribed in the Building Code.

(f) Air leakage. Windows and doors.

(i) All exterior windows and doors shall be gasketed or weatherstripped.

(ii) If the existing windows and doors are replaced with factory manufactured windows, the windows shall be double glazed units or shall be equipped with interior or exterior storm windows.

(iii) Single glazed windows which are part of the historic features of the building may be retained, repaired, or restored with or without the addition of storm windows.

(g) Chimney flues. Chimney flues which are no longer in use shall be closed off and sealed against air leakage.

(h) Exterior openings. The following openings in the exterior building envelope shall be caulked, gasketed, or otherwise sealed:

(i) Exterior joints around window and door frames;

(ii) Penetrations of utility services through walls, floors, and roofs.

(iii) Any other penetrations as required by the building official.

(i) Insulation materials. New insulation materials shall conform to the applicable provisions of the building, mechanical, plumbing, and energy codes for fire-resistance, flame-spread, smoke-density ratings and Building Code provisions for roof and exposed deck ceiling insulation.

(3) Building mechanical systems. Existing heating, ventilation, and cooling systems which are part of the significant historic features of the building or structure, and which in the opinion of the building official do not constitute a safety hazard, may remain in use, be repaired or be replaced in kind. Replacement, alteration, or addition of other heating, ventilation, and cooling equipment shall comply with the provisions of the energy, ventilation and indoor air quality, mechanical, and plumbing codes.

(4) Water heating. Replacement or addition of water heating equipment shall comply with the provisions of the Energy Code.

(5) Lighting. Existing lighting may be retained, repaired, and replaced in kind or with replica fixtures. Areas of buildings or structures in which lighting is being replaced shall conform to the requirements of the Energy Code where practical. Appropriate clearances of insulation material from sources of heat; i.e., light fixtures, shall be as required by the Building Code requirements.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-810, filed 12/18/90, effective 7/1/91.]

## PART IX APPENDICES

### WAC 51-19-900 Appendix A.

Table A - 901

BUILDING FEATURES					
	ENTRY	DOORS	TOILET ROOMS	FLOORS & LEVELS	
Instructions:	Prevailing Codes:	Prevailing Codes:	Prevailing Codes:	Prevailing Codes:	
1. Determine Building Category; i.e., II.D. under Building Type and Historical Aspects.	Primary public entrance with access to elevators available	-31 1/2" clear openings -5' level perpendicular to closed door -18" clear at strike side	5'-0" x 4'-8" stall clear Length 32" min. clear entry in front of compartment Door 32" clear Turn 60" diameter circle Lavy. 29" clear under for newly designed space. See WAC 51-10 Sec. 511.1.	-Access to all floors, except in offices, retail shops -Floor on given story level or ramped.	
2. Go to box in category under Building Features.					
3. Numbers in box refer to the Alternatives List.					
Category (Building Type and Historical Aspects)	ENTRY See Alternatives List	DOORS See Alternatives List	TOILET ROOMS See Alternatives List	FLOORS & LEVELS See Alternatives List	
I. Publicly owned or leased building providing governmental services to general public; i.e., City Hall, Courthouse, etc., adaptive use, restoration, or reconstruction.					
A. Exterior (shell) historical all or part, Interior nonhistorical.	2, 4	1, Exterior only None interior	None	N.A.	
B. Interior historical - all or part, Exterior nonhistorical.		1,2 Interior only None exterior	1, 2	1, 2	
C. All historical major change in use, change in occupancy.	2, 4	1, Exterior 1, 2 Interior only	1, 2	1, 2	
D. All historical - minor change in use to equal or less intensive occupancy. Limited services.	2, 4	1, Exterior 1,2, Interior only	1, 2	1, 2	
II. Privately owned buildings offering services to consumers; i.e., taverns, restaurants, general shops, etc., or buildings owned by government and leased or consigned to private operator.					
A. Adaptive use restoration, reconstruction, Interior nonhistoric, Exterior historical (all or part).	1, 2, 3, 4	1, Exterior, and 1 Interior.	None	N.A.	

BUILDING FEATURES					
		ENTRY	DOORS	TOILET ROOMS	FLOORS & LEVELS
B.	Interior historical - (all or part), Exterior		None exterior,	1, 2, 3	N.A.
C.	All historical - major change in use, change in occupancy, or mixed occupancy. Minor change of use to equal or less intensive occupancy.	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
D.	Reconstruction, or restoration. No change in use except to museum. (Minor mixed occupancy with administration space would be allowed.)	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
E.	Museum quality restoration and/or reconstruction including museum use. (Minor mixed occupancy compatible with that use would be allowed.) Also includes renovation of historical building or site.	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
III.	Privately or publicly owned buildings used as museums or as site for display of the building itself; i.e., museum, schoolhouse, garden centers, galleries, etc.				
A.	Reconstruction, or restoration. No change in use except to museum. (Minor mixed occupancy such as administrative would be allowed).	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
B.	Museum quality restoration and/or reconstruction museum use (Minor mixed occupancy compatible with that would be allowed). Also includes renovation of historical building or site.	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
IV.	Privately owned buildings not open to general public but employing 3 or more persons; i.e., business offices.				
A.	Adaptive use - Interior nonhistorical, Exterior historical (all or part).	1, 2, 3, 4	1, 2, 3, Exterior, None interior	1, 2	1, 2, 3, Exterior Access, None interior access
B.	Adaptive use - Interior historical, Exterior nonhistorical.	1, 2, 3, 4	None exterior, 1, 2, 3, interior	1, 2	None exterior access, 1, 2, 3, interior access
C.	All historical - major change in use, change in occupancy or mixed occupancy. Minor change of use to equal or less intensive occupancy.	1, 2, 3, 4	1 through 3	1, 2	1, 2, 3
D.	Reconstruction, or restoration. No change in use - except to museum. (Minor mixed occupancy such as administrative would be allowed.)	1, 2, 3, 4	1 through 3	1, 2	1, 2, 3
V.	Buildings employing less than 3 people.	All alternatives 1, 2, 3, 4	All alternatives 1 - 3	All alternatives 1 - 3	All alternatives 1 - 3

ALTERNATIVES LIST

These alternatives are listed in order of priority and are to be used with Table A-901.

ENTRY:

1. Ramp at greater than standard slope, but no greater than 1:9 for a horizontal distance not to exceed 12 feet at main, side, or rear entrance.
2. Access, listed in the order of priority, at grade or by ramp or lift to any entrance used by general public.
3. Ramp no greater than 1:6 slope for a distance not to exceed a horizontal distance of 2 feet at main, side, or rear entrance.
4. Access, listed in the order of priority, at grade, or by ramp, or lift at any entrance not used by general public but open (unlocked), with directional signs.

DOORS: (One means of entry into spaces requiring access)

1. 30-inch width of clear opening operable by single motion.

2. Usable 29 1/2 inches 66-175 clear opening with door(s) operable by single motion.
3. Single or double door to provide a usable 29 1/2 inches clear opening.

TOILET ROOMS:

1. Toilet facility of dimensions no less than those provided in the prevailing provisions in chapter 51-10 WAC designated as a unisex toilet for disabled persons.
2. Provide unisex toilet for disabled persons and general public.
3. No toilet for anyone.

FLOORS AND LEVELS:

1. Access to experiences, services, functions and materials and resources; i.e., maps, plans, courtroom, council chambers, etc., at accessible levels.
2. Access provided to levels and floors by ramps of greater than standard slope and no greater than 1:9 for horizontal distances not to exceed 12 feet. Lifts may be provided.

3. Access provided to levels and floors by ramps of 1:6 slope for horizontal distance not to exceed 2 feet. Adequate warnings shall be provided to indicate steepness of the slope.

## USE NOTES:

1. Listed alternatives only apply to building requiring construction permits.
2. These alternatives should be used only where it is not possible to meet prevailing code.
3. Alternatives should be used only in those portions of the building that are historical.
4. Alternatives apply to access for physically disabled persons.
5. Alternatives apply to historic buildings only.
6. For other accessibility standards, see chapter 51-10 WAC.
7. Alternatives are listed in priority order.
8. No alternatives are allowed for simulations.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-900, filed 12/18/90, effective 7/1/91.]

**WAC 51-19-901 Appendix B—Bibliography.**

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[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-901, filed 12/18/90, effective 7/1/91.]

**Chapter 51-50 WAC**

**STATE BUILDING CODE ADOPTION AND  
AMENDMENT OF THE 2006 EDITION OF THE  
INTERNATIONAL BUILDING CODE**  
(Formerly chapter 51-40 WAC)

**WAC**

51-50-001	Authority.
51-50-002	Purpose.
51-50-003	International Building Code.
51-50-004	Conflicts with Washington State Ventilation and Indoor Air Quality Code.
51-50-005	International Building Code requirements for barrier-free accessibility.
51-50-007	Exceptions.
51-50-008	Implementation.
51-50-009	Recyclable materials and solid waste storage.
51-50-0107	Temporary structures and uses.
51-50-0200	Chapter 2—Definitions.
51-50-0305	Section 305—Educational Group E.
51-50-0308	Section 308—Institutional Group I.
51-50-0310	Section 310—Residential Group R.
51-50-0406	Section 406—Motor-vehicle-related occupancies.
51-50-0407	Section 407—Group I-2.
51-50-0502	Section 502—Definitions.
51-50-0506	Area modifications.
51-50-0509	Section 509—Special provisions.
51-50-0707	Section 707—Shaft enclosures.
51-50-0902	Section 902—Definitions.
51-50-0903	Section 903—Automatic sprinkler systems.
51-50-0909	Section 909—Smoke control systems.
51-50-1008	Section 1008—Doors, gates and turnstiles.
51-50-1009	Section 1009—Stairways and handrails.
51-50-1014	Exit access.
51-50-1015	Exit and exit access doorways.
51-50-1017	Corridors.
51-50-1019	Number of exits and continuity.
51-50-1101	Section 1101—General.
51-50-1106	Section 1106—Parking and passenger loading facilities.
51-50-1107	Section 1107—Dwelling units and sleeping units.
51-50-1203	Section 1203—Ventilation.
51-50-1204	Section 1204—Temperature control.
51-50-1208	Section 1208—Interior space dimensions.
51-50-1210	Section 1210—Surrounding materials.
51-50-1405	Section 1405—Installation of wall coverings.
51-50-1602	Section 1602—Definitions and notations.
51-50-1607	Section 1607—Live loads.
51-50-1702	Section 1702—Definitions.
51-50-1714	Section 1714—Preconstruction load tests.
51-50-2106	Section 2106—Seismic design.
51-50-2108	Section 2108—Strength design of masonry.
51-50-2114	Section 2114—Emission standards.
51-50-2900	Chapter 29—Plumbing systems.
51-50-3001	Section 3001—General.
51-50-3004	Section 3004—Hoistway venting.
51-50-3006	Section 3006—Machine rooms.
51-50-3103	Temporary structures.
51-50-3109	Section 3109—Swimming pool enclosures and safety devices.
51-50-31200	Section 31-2—Standard test method for particulate emissions from fireplaces.
51-50-3408	Section 3408—Moved structures.
51-50-3409	Section 3409—Accessibility for existing buildings.
51-50-480000	Appendix Chapter M.

**INTERNATIONAL EXISTING BUILDING CODE 2006 EDITION**

51-50-480101	Section 101—General.
51-50-480102	Section 102—Applicability.
51-50-480302	Section 302—Additions, alterations or repairs.
51-50-480305	Section 305—Change of occupancy.
51-50-480405	Section 405—Alteration—Level 3.
51-50-480506	Section 506—Structural.

51-50-480704	Section 704—Fire protection.
51-50-480807	Section 807—Structural.
51-50-480912	Section 912—Change of occupancy classification.
51-50-481101	Chapter 11—Historic buildings—Section 1101—General.
51-50-481102	Section 1102—Repairs.
51-50-481103	Section 1103—Fire safety.
51-50-481104	Alterations.
51-50-481105	Section 1105—Change of occupancy.
51-50-481106	Section 1106—Structural.
51-50-481301	Chapter 13—Performance compliance methods.
51-50-481500	Chapter 15—Referenced standards.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

51-50-0302	Section 302—Classification. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0302, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-0313	Section 313—Licensed Care Group LC. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0313, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-0419	Section 419—Group LC. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0419, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-1010	Section 1010—Ramps. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1010, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-1024	Section 1024—Assembly. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1024, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-1103	Section 1103—Scoping requirements. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1103, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-1104	Section 1104—Accessible route. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1104, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-1105	Section 1105—Accessible entrances. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1105, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-1109	Section 1109—Other features and facilities. [Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-1109, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1109, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-1605	Section 1605—Load combinations. [Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-1605, filed 12/2/04, effective 7/1/05.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-1709	Section 1709—Structural observations. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1709, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07.

51-50-2107	Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. Section 2107—Working stress design. [Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-2107, filed 12/2/04, effective 7/1/05.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-2406	Section 2406—Safety glazing. [Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-24-070, § 51-50-2406, filed 12/5/05, effective 7/1/06.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-3002	Section 3002—Hoistway enclosures. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-3002, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-3003	Section 3003—Emergency operations. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-3003, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.
51-50-3005	Section 3005—Conveying systems. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-3005, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-091, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.

**WAC 51-50-001 Authority.** These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-001, filed 12/17/03, effective 7/1/04.]

**WAC 51-50-002 Purpose.** The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-002, filed 12/17/03, effective 7/1/04.]

**WAC 51-50-003 International Building Code.** The 2006 edition of the *International Building Code*, including Appendix E, published by the International Code Council is hereby adopted by reference with the exceptions noted in this chapter of the Washington Administrative Code.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-003, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-003, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-18-033, § 51-50-003, filed 8/25/04, effective 9/25/04. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-003, filed 12/17/03, effective 7/1/04.]

**WAC 51-50-004 Conflicts with Washington State Ventilation and Indoor Air Quality Code.** In the case of conflict between the ventilation requirements of chapter 12 of this code and the ventilation requirements of chapter 51-13



WAC, the provisions of the Ventilation and Indoor Air Quality Code shall govern.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-004, filed 12/17/03, effective 7/1/04.]

**WAC 51-50-005 International Building Code requirements for barrier-free accessibility.** Chapter 11 and other International Building Code requirements for barrier-free access, including ICC A117.1-2003 and Appendix E, are adopted pursuant to chapters 70.92 and 19.27 RCW.

Pursuant to RCW 19.27.040, chapter 11 and requirements affecting barrier-free access shall not be amended by local governments.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-005, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-005, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-18-033, § 51-50-005, filed 8/25/04, effective 9/25/04. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-005, filed 12/17/03, effective 7/1/04.]

**WAC 51-50-007 Exceptions.** The exceptions and amendments to the International Building Code contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

The provisions of this code do not apply to temporary growing structures used solely for the commercial production of horticultural plants including ornamental plants, flowers, vegetables, and fruits. "Temporary growing structure" means a structure that has the sides and roof covered with polyethylene, polyvinyl, or similar flexible synthetic material and is used to provide plants with either frost protection or increased heat retention. A temporary growing structure is not considered a building for purposes of this code.

The provisions of this code do not apply to the construction, alteration, or repair of temporary worker housing except as provided by rule adopted under chapter 70.114A RCW or chapter 37, Laws of 1998 (SB 6168). "Temporary worker housing" means a place, area, or piece of land where sleeping places or housing sites are provided by an employer for his or her employees or by another person, including a temporary worker housing operator, who is providing such accommodations for employees, for temporary, seasonal occupancy, and includes "labor camps" under RCW 70.54.110.

Codes referenced which are not adopted through RCW 19.27.031 or chapter 19.27A RCW shall not apply unless specifically adopted by the authority having jurisdiction. The 2006 International Existing Building Code is referenced in this code as Appendix Chapter M and may be adopted by the authority having jurisdiction in accordance with Section 101.2.1.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-007, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-007, filed 12/17/03, effective 7/1/04.]

**WAC 51-50-008 Implementation.** The International Building Code adopted under chapter 51-50 WAC shall become effective in all counties and cities of this state on July 1, 2007.

[Title 51 WAC—p. 150]

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-008, filed 12/17/03, effective 7/1/04.]

**WAC 51-50-009 Recyclable materials and solid waste storage.** For the purposes of this section, the following definition shall apply:

**RECYCLED MATERIALS** means those solid wastes that are separated for recycling or reuse, such as papers, metals and glass.

All local jurisdictions shall require that space be provided for the storage of recycled materials and solid waste for all new buildings.

EXCEPTION: Group R-3 and Group U Occupancies.

The storage area shall be designed to meet the needs of the occupancy, efficiency of pickup, and shall be available to occupants and haulers.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-009, filed 12/17/03, effective 7/1/04.]

### WAC 51-50-0107 Temporary structures and uses.

**107.1 General.** The building official is authorized to issue a permit for temporary structures and temporary uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The building official is authorized to grant extensions for demonstrated cause.

EXCEPTION: The building official may authorize unheated tents and yurts under 500 square feet accommodating an R-1 Occupancy for recreational use as a temporary structure and allow them to be used indefinitely.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0107, filed 12/19/06, effective 7/1/07.]

### WAC 51-50-0200 Chapter 2—Definitions.

#### SECTION 202—DEFINITIONS.

**ADULT FAMILY HOME.** See Section 310.2.

**CHILD DAY CARE.** See Section 310.2.

**CHILD DAY CARE HOME, FAMILY.** See Section 310.2.

**NIGHTCLUB.** An establishment, other than a theater with fixed seating, which includes all of the following:

1. Provides live entertainment by paid performing artists or by way of recorded music conducted by a person employed or engaged to do so;
2. Has as its primary source of revenue the sale of beverages of any kind for consumption on the premises and/or cover charges;
3. Has an occupant load of 100 or more as determined by the fire code official; and
4. Includes assembly space without fixed seats considered concentrated or standing space per Table 1004.1.2.

Paid performing artists are those entertainers engaged to perform in a for-profit business establishment.

**PORTABLE SCHOOL CLASSROOM.** See Section 902.1.

**RESIDENTIAL CARE/ASSISTED LIVING FACILITIES.** See Section 310.2. This definition is not adopted.

(2007 Ed.)

**STORY.** That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above, including basements (also see "Mezzanine" and Section 502.1). It is measured as the vertical distance from top to top of two successive tiers of beams or finished floor surfaces and, for the topmost story, from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.

**STORY ABOVE GRADE PLANE.** Any story having its finished floor surface entirely above grade plane, except that a basement shall be considered as a story above grade plane where the finished surface of the floor or roof next above the basement is:

1. More than 6 feet (1829 mm) above grade plane; or
2. More than 12 feet (3658 mm) above the finished ground level at any point.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0200, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 05-24-070, § 51-50-0200, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0200, filed 12/17/03, effective 7/1/04.]

## **WAC 51-50-0305 Section 305—Educational Group E.**

**305.2 Day Care.** The use of a building or structure, or portion thereof, for educational, supervision or personal care services for more than five children older than 2 1/2 years of age, shall be classified as a Group E Occupancy.

**EXCEPTION:** Family child day care homes licensed by the Washington state department of social and health services for the care of twelve or fewer children shall be classified as Group R-3.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0305, filed 12/17/03, effective 7/1/04.]

## **WAC 51-50-0308 Section 308—Institutional Group I.**

**308.2 Group I-1.** This occupancy shall include buildings, structures or parts thereof housing more than 16 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

- Residential board and care facilities
- Assisted living facilities
- Halfway houses
- Group homes
- Congregate care facilities
- Social rehabilitation facilities
- Alcohol and drug centers
- Convalescent facilities

A facility such as the above with five or fewer persons and adult family homes licensed by the Washington state department of social and health services shall be classified as a Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2.

(2007 Ed.)

A facility such as the above providing licensed care to clients in one of the categories listed in Section 310.1 regulated by either the Washington department of health or the department of social and health services shall be classified as Group R-2.

**308.3 Group I-2.** This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing or custodial care on a 24-hour basis of more than five persons who are not capable of self-preservation. This group shall include, but not be limited to, the following:

- Hospitals
- Nursing homes (both intermediate-care facilities and skilled nursing facilities)
- Mental hospitals
- Detoxification facilities

A facility such as the above with five or fewer persons shall be classified as Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2.

A facility such as the above providing licensed care to clients in one of the categories listed in Section 310.1 regulated by either the Washington department of health or the department of social and health services shall be classified as Group R-2.

**308.5.2 Child care facility.** A facility that provides supervision and personal care on a less than 24-hour basis for more than five children 2 1/2 years of age or less shall be classified as Group I-4.

**EXCEPTIONS:**

1. A child day care facility that provides care for more than five but no more than 100 children 2 1/2 years or less of age, when the rooms where such children are cared for are located on the level of exit discharge and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.
2. Family child day care homes licensed by the Washington state department of social and health services for the care of twelve or fewer children shall be classified as Group R-3.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0308, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0308, filed 12/17/03, effective 7/1/04.]

## **WAC 51-50-0310 Section 310—Residential Group R.**

**310.1 Residential Group R.** Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2. Residential occupancies shall include the following:

**R-1** Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

- Boarding houses (transient)
- Hotels (transient)
- Motels (transient)

**R-2** Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

- Apartment houses
- Boarding houses (not transient)

Boarding homes as licensed by department of social and health services under chapter 388-78A WAC

Convents

Dormitories

Fraternities and sororities

Hotels (nontransient)

Monasteries

Motels (nontransient)

Residential treatment facilities as licensed by department of health under chapter 246-337 WAC

Vacation timeshare properties

**R-3** Residential occupancies where the occupants are primarily permanent in nature and not classified as R-1, R-2, R-4 or I and where buildings do not contain more than two dwelling units as applicable in Section 101.2, including adult family homes and family child day care homes for the care of twelve or fewer children, licensed by the Washington state department of social and health services, or adult and child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours. Adult family homes and family child day care homes, or adult and child care facilities that are within a single-family home are permitted to comply with the International Residential Code in accordance with Section 101.2.

Foster family care homes licensed by the Washington state department of social and health services shall be permitted, as an accessory use to a dwelling, for six or fewer children including those of the resident family.

R-4 classification is not adopted. Any reference in this code to R-4 does not apply.

### 310.2 Definitions.

**ADULT FAMILY HOME** means a dwelling in which a person or persons provide personal care, special care, room and board to more than one but not more than six adults who are not related by blood or marriage to the person or persons providing the services.

**CHILD DAY CARE**, shall, for the purposes of these regulations, mean the care of children during any period of a 24-hour day.

**CHILD DAY CARE HOME, FAMILY** is a child day care facility, licensed by the state, located in the dwelling of the person or persons under whose direct care and supervision the child is placed, for the care of twelve or fewer children, including children who reside at the home.

**RESIDENTIAL CARE/ASSISTED LIVING FACILITIES.** This definition is not adopted.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0310, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0310, filed 12/17/03, effective 7/1/04.]

### WAC 51-50-0406 Section 406—Motor-vehicle-related occupancies.

**406.2.6 Floor surface.** Parking surfaces shall be of concrete or similar noncombustible and nonabsorbent materials.

EXCEPTION: Asphalt parking surfaces are permitted at ground level.

[Title 51 WAC—p. 152]

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0406, filed 12/19/06, effective 7/1/07.]

### WAC 51-50-0407 Section 407—Group I-2.

**407.8 Locks on exit doors.** Approved, listed locks without delayed egress shall be permitted in nursing homes or portions of nursing homes, provided that:

1. The clinical needs of one or more patients require specialized security measures for their safety.

2. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.

3. The doors unlock upon loss of electrical power controlling the lock or lock mechanism.

4. The lock shall be capable of being deactivated by a signal from a switch located in an approved location.

5. There is a system, such as a keypad and code, in place that allows visitors, staff persons and appropriate residents to exit. Instructions for exiting shall be posted within six feet of the door.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0407, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-0407, filed 12/2/04, effective 7/1/05.]

### WAC 51-50-0502 Section 502—Definitions.

**502.1 Definitions.** The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**BASEMENT.** A story that is partly or completely below grade plane (see "Story above grade plane" in Section 202). A basement shall be considered as a story above grade plane where the finished surface of the floor or roof next above the basement is:

1. More than 6 feet (1829 mm) above grade plane; or
2. More than 12 feet (3658 mm) above the finished ground level at any point.

**STORY.** That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above, including basements (also see "Basement" and "Mezzanine").

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0502, filed 12/19/06, effective 7/1/07.]

### WAC 51-50-0506 Area modifications.

**506.1.1 Basements.** Basements below the first story above grade plane need not be included in the total allowable area provided each such basement does not exceed the area permitted for a building with no more than one story above grade plane.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0506, filed 12/19/06, effective 7/1/07.]

### WAC 51-50-0509 Section 509—Special provisions.

**509.2 Group S-2 enclosed or open parking garage with Group A, B, M, R or S above.** A building shall be consid-

(2007 Ed.)

ered as two separate and distinct buildings for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction, where all of the following conditions are met:

1. The buildings are separated with a horizontal assembly having a minimum 3-hour fire-resistance rating.
2. The building below the horizontal assembly is no more than one story above grade plane.
3. The building below the horizontal assembly is of Type IA construction.
4. Shaft, stairway, ramp and escalator enclosures through the horizontal assembly shall have not less than a 2-hour fire-resistance rating with opening protectives in accordance with Table 715.4.

**EXCEPTION:** Where the enclosure walls below the horizontal assembly have not less than a 3-hour fire-resistance rating with opening protectives in accordance with Table 715.4, the enclosure walls extending above the horizontal assembly shall be permitted to have a 1-hour fire-resistance rating, provided:

1. The building above the horizontal assembly is not required to be of Type I construction.
2. The enclosure connects less than four stories, and
3. The enclosure opening protectives above the horizontal assembly have a minimum 1-hour fire-protection rating.

5. The building above the horizontal assembly shall be permitted to have multiple Group A uses each with an occupant load of less than 300, or Group B, M, R or S uses;

6. The building below the horizontal assembly is a Group S-2 enclosed or open parking garage, used for the parking and storage of private motor vehicles.

**EXCEPTIONS:**

1. Entry lobbies, mechanical rooms and similar uses incidental to the operation of the building shall be permitted.
2. Multiple Group A uses, each with an occupant load of less than 300, or Group B or M uses shall be permitted in addition to those uses incidental to the operation of the building (including storage areas), provided that the entire structure below the horizontal assembly is protected throughout by an approved automatic sprinkler system.

7. The maximum building height in feet shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from grade plane.

**509.3 Group S-2 enclosed parking garage with Group S-2 open parking garage above.** A Group S-2 enclosed parking garage with no more than one story above grade plane and located below a Group S-2 open parking garage shall be classified as a separate and distinct building for the purpose of determining the type of construction where the following conditions are met:

1. The allowable area of the building shall be such that the sum of the ratios of the actual area divided by the allowable area for each separate occupancy shall not exceed 1.0.
2. The Group S-2 enclosed parking garage is of Type I or II construction and is at least equal to the fire-resistance requirements of the Group S-2 open parking garage.
3. The height and number of tiers of the Group S-2 open parking garage shall be limited as specified in Table 406.3.5.
4. The floor assembly separating the Group S-2 enclosed parking garage and Group S-2 open parking garage shall be protected as required for the floor assembly of the Group S-2 enclosed parking garage. Openings between the Group S-2 enclosed parking garage and Group S-2 open parking garage, except exit openings, shall not be required to be protected.

(2007 Ed.)

5. The Group S-2 enclosed parking garage is used exclusively for the parking or storage of private motor vehicles, but shall be permitted to contain an office, waiting room and toilet room having a total area of not more than 1,000 square feet (93 m<sup>2</sup>), and mechanical equipment rooms incidental to the operation of the building.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0509, filed 12/19/06, effective 7/1/07.]

## **WAC 51-50-0707 Section 707—Shaft enclosures.**

**707.14.2 Enclosed elevator lobby pressurization alternative.** Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with this section.

**707.14.2.1 Pressurization requirements.** Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.10 inches of water column with respect to adjacent occupied space on all floors and a maximum pressure so as to not prevent the automatic operation of the elevator doors, as well as accounting for the stack and wind effect expected on the mean low temperature January day. This pressure shall be measured at the midpoint of each hoistway door, with all hoistway doors open at the designated primary recall level and all other hoistway doors closed. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet from any air exhaust system or outlet.

**707.14.2.2 Ducts for system.** Any duct system that is part of the pressurization system shall be protected with the same fire-resistance rating as required for the elevator shaft enclosure.

**707.14.2.3 Fan system.** The fan system provided for the pressurization system shall be as required by this section.

**707.14.2.3.1 Fire resistance.** When located within the building, the fan system that provides the pressurization shall be protected with the same fire-resistance rating required for the elevator shaft enclosure.

**707.14.2.3.2 Smoke detection.** The fan system shall be equipped with a smoke detector that will automatically shut down the fan system when smoke is detected within the system.

**707.14.2.3.3 Separate systems.** A separate fan system shall be used for each bank of elevators.

**707.14.2.3.4 Fan capacity.** The supply fan shall either be adjustable with a capacity of at least 1000-cfm (.4719 m<sup>3</sup>/s) per door, or that specified by a registered design professional to meet the requirements of a designed pressurization system.

**707.14.2.4 Standby power.** The pressurization system shall be provided with standby power from the same source as other required emergency systems for the building.

**707.14.2.5 Activation of pressurization system.** The elevator pressurization system shall be activated upon activation of the building fire alarm system or upon activation of the elevator lobby smoke detectors.

**707.14.2.6 Elevator doors.** Each elevator door shall operate properly when hoistway pressurization is in effect.

**707.14.2.7 Hoistway venting.** Hoistway venting required by Section 3004 need not be provided for pressurized elevator shafts.

**707.14.2.8 Machine rooms.** Elevator machine rooms shall be pressurized in accordance with this section unless separated from the hoistway shaft by construction in accordance with Section 707.

**707.14.2.9 Special inspection.** Special inspection for performance shall be required in accordance with Section 909.18.8. System acceptance shall be in accordance with Section 909.19.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0707, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0707, filed 12/17/03, effective 7/1/04.]

## WAC 51-50-0902 Section 902—Definitions.

### 902.1 Definitions.

**PORTABLE SCHOOL CLASSROOM.** A structure, transportable in one or more sections, which requires a chassis to be transported, and is designed to be used as an educational space with or without a permanent foundation. The structure shall be trailerable and capable of being demounted and relocated to other locations as needs arise.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0902, filed 12/17/03, effective 7/1/04.]

## WAC 51-50-0903 Section 903—Automatic sprinkler systems.

**903.2.1.6 Nightclub.** An automatic sprinkler system shall be provided throughout an occupancy with a nightclub. Existing nightclubs constructed prior to July 1, 2006, shall be provided with automatic sprinklers not later than December 1, 2007. The fire code official, for the application of this rule, may establish an occupant load based on the observed use of the occupancy in accordance with Table 1004.1.2.

**903.2.2 Group E.** An automatic sprinkler system shall be provided for Group E Occupancies.

**EXCEPTIONS:**

1. Portable school classrooms, provided aggregate area of any cluster or portion of a cluster of portable school classrooms does not exceed 5,000 square feet (465 m<sup>2</sup>); and clusters of portable school classrooms shall be separated as required in chapter 5 of the building code.
2. Group E occupancies with an occupant load of 50 or less.

**903.2.7 Group R.** An automatic fire sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

**EXCEPTION:** Group R-1 if all of the following conditions apply:

1. The Group R fire area is no more than 500 square feet and is used for recreational use only.
2. The Group R fire area is only one story.
3. The Group R fire area does not include a basement.
4. The Group R fire area is no closer than 30 feet from another structure.
5. Cooking is not allowed within the Group R fire area.
6. The Group R fire area has an occupant load of no more than 8.

7. A hand held (portable) fire extinguisher is in every Group R fire area.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0903, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 05-24-070, § 51-50-0903, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0903, filed 12/17/03, effective 7/1/04.]

## WAC 51-50-0909 Section 909—Smoke control systems.

**909.6.3 Elevator shaft pressurization.** Where elevator shaft pressurization is required to comply with Exception 6 of Section 707.14.1, the pressurization system shall comply with and be maintained in accordance with 707.14.2.

**909.6.3.1 Activation.** The elevator shaft pressurization system shall be activated by a fire alarm system which shall include smoke detectors or other approved detectors located near the elevator shaft on each floor as approved by the building official and fire code official. If the building has a fire alarm panel, detectors shall be connected to, with power supplied by, the fire alarm panel.

**909.6.3.2 Power system.** The power source for the fire alarm system and the elevator shaft pressurization system shall be in accordance with Section 909.11.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0909, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 05-24-070, § 51-50-0909, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0909, filed 12/17/03, effective 7/1/04.]

## WAC 51-50-1008 Section 1008—Doors, gates and turnstiles.

**1008.1.2 Door swing.** Egress doors shall be side-hinged swinging.

**EXCEPTIONS:**

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 Occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2 and R-3.
5. In other than Group H Occupancies, revolving doors complying with Section 1008.1.3.1.
6. In other than Group H Occupancies, horizontal sliding doors complying with Section 1008.1.3.3 are permitted as a means of egress.
7. Power-operated doors in accordance with Section 1008.1.3.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. In other than Group H Occupancies, manually operated horizontal sliding doors are permitted in a means of egress from occupied spaces with an occupant load of 10 or less.

Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H Occupancy.

The opening force for interior side-swinging doors without closers shall not exceed a 5-pound (22 N) force. For other side-swinging, sliding, and folding doors, the door latch shall release when subjected to a 15-pound (67 N) force. The door shall be set in motion when subjected to a 30-pound (133 N) force. The door shall swing to a full-open position when sub-

jected to a 15-pound (67 N) force. Forces shall be applied to the latch side.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 05-24-070, § 51-50-1008, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1008, filed 12/17/03, effective 7/1/04.]

## **WAC 51-50-1009 Section 1009—Stairways and handrails.**

**1009.12 Stairways in individual dwelling units.** Stairs or ladders within an individual dwelling unit used for access to areas of 200 square feet (18.6 m<sup>2</sup>) or less, and not containing the primary bathroom or kitchen, are exempt from the requirements of Section 1009.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1009, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1009, filed 12/17/03, effective 7/1/04.]

## **WAC 51-50-1014 Exit access.**

**1014.2.2 Group I-2.** Habitable rooms or suites in Group I-2 occupancies shall have an exit access door leading directly to a corridor.

**EXCEPTION:** Rooms with exit doors opening directly to the outside at ground level.

**1014.2.2.1 Definition.** For the purposes of this section, a suite is defined as a cluster of rooms or spaces sharing common circulation. Partitions within a suite are not required to have smoke or fire-resistance-rated construction unless required by another section of this Code.

**1014.2.3 Suites in patient sleeping areas.** Patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites if one of the following conditions is met:

1. The intervening room within the suite is not used as an exit access for more than eight patient beds.
2. The arrangement of the suite allows for direct and constant visual supervision by nursing personnel.

**1014.2.3.1 Area.** Suites of sleeping rooms shall not exceed 5,000 square feet (465 m<sup>2</sup>).

**1014.2.3.2 Exit access.** Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93 m<sup>2</sup>) shall have at least two exit access doors remotely located from each other.

**1014.2.3.3 Travel distance.** The travel distance between any point in a suite of sleeping rooms and an exit access door of that suite shall not exceed 100 feet (30,480 mm).

**1014.2.4 Suites in areas other than patient sleeping areas.** Areas other than patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites.

**1014.2.4.1 Area.** Suites of rooms, other than patient rooms, shall not exceed 10,000 square feet (929 m<sup>2</sup>).

**1014.2.4.2 Exit access.** Any rooms or suite of rooms, other than patient sleeping rooms, of more than 2,500 square feet

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(232 m<sup>2</sup>) shall have at least two exit access doors remotely located from each other.

**1014.2.4.3 One intervening room.** For rooms other than patient sleeping rooms, suites of rooms are permitted to have one intervening room if the travel distance within the suite is not greater than 100 feet (30,480 mm).

**1014.2.4.4 Two intervening rooms.** For rooms other than patient sleeping rooms located within a suite, exit access travel from within the suite shall be permitted through two intervening rooms where the travel distance to the exit access door is not greater than 50 feet (15,240 mm).

**1014.2.5 Travel distance.** The travel distance between any point in a Group I-2 Occupancy patient room and an exit access door in that room shall not exceed 50 feet (15,240 mm).

**1014.2.6 Separation.** Suites in Group I-2 Occupancies shall be separated from other portions of the building by a smoke partition complying with Section 710.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1014, filed 12/19/06, effective 7/1/07.]

## **WAC 51-50-1015 Exit and exit access doorways.**

**1015.1 (IFC 1015.1) Exits or exit access doorways from spaces.** Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:

1. The occupant load of the space exceeds one of the values in Table 1015.1.

**EXCEPTION:** One means of egress is permitted within and from dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

2. The common path of egress travel exceeds one of the limitations of Section 1014.3.

3. Where required by Sections 1015.3, 1015.4, 1015.5, 1015.6 or 1015.6.1.

**EXCEPTION:** Group I-2 occupancies shall comply with Section 1014.2.2.

**TABLE 1015.1 (IFC 1015.1)  
SPACES WITH ONE MEANS OF EGRESS**

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E <sup>a</sup> , F, M, U	49
H-1, H-2, H-3	3
H-4, H-5, I-1, I-3, I-4, R	10
S	29

a. Day care maximum occupant load is 10.

**1015.1.1 (IFC 1015.1.1) Three or more exits or exit access doorways.** Three exits or exit access doorways shall be provided from any space with an occupant load of 501-1,000. Four exits or exit access doorways shall be provided from any space with an occupant load greater than 1,000.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1015, filed 12/19/06, effective 7/1/07.]

**WAC 51-50-1017 Corridors.**

**1017.1 Construction.** Corridors shall be fire-resistance rated in accordance with Table 1017.1. The corridor walls required to be fire-resistance rated shall comply with Section 708 for fire partitions.

EXCEPTIONS:

1. A fire-resistance rating is not required for corridors in an occupancy in Group E where each room that is used for instruction has at least one door directly to the exterior and rooms for assembly purposes have at least one-half of the required means of egress doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.
2. A fire-resistance rating is not required for corridors contained within a dwelling or sleeping unit in an occupancy in Group R.
3. A fire-resistance rating is not required for corridors in open parking garages.
4. A fire-resistance rating is not required for corridors in an occupancy in Group B which is a space requiring only a single means of egress complying with Section 1015.1.
5. In Group R-2 boarding homes and residential treatment facilities licensed by Washington state, rest areas constructed as required for corridors shall be allowed to be open to the corridor provided:
  - 5.1 The area does not exceed 150 square feet, excluding the corridor width;
  - 5.2 The floor is separated into at least two compartments complying with Section 407.4;
  - 5.3 Combustible furnishings located within the rest area shall be in accordance with the International Fire Code section 805;
  - 5.4 Emergency means of egress lighting is provided as required by Section 1006 to illuminate the area.

**1017.4 Air movement in corridors.** Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

EXCEPTIONS:

1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of one thousand square feet (93 m<sup>2</sup>) or less in area, utilization of corridors for conveying return air is permitted.
4. Where such air is part of an engineered smoke control system.
5. Make up or relief air in corridors of Group 1-2 Occupancies.
6. Corridors serving residential occupancies shall be permitted to be supplied without specific mechanical exhaust subject to the following:
  - 6.1 The supply air is one hundred percent outside air; and
  - 6.2 The units served by the corridor have conforming ventilation independent of the air supplied to the corridor; and
  - 6.3 For other than high-rise buildings, the supply fan will automatically shut off upon activation of corridor smoke detectors which shall be spaced at no more than thirty feet (9,144 mm) on center along the corridor; or
  - 6.4 For high-rise buildings, corridor smoke detector activation will close required smoke/fire dampers at the supply inlet to the corridor at the floor receiving the alarm.

**1017.6 Subdivision of building spaces—Smoke barriers.** Smoke barriers complying with Section 709 shall be installed on floors other than the level of exit discharge of a Group R-2 boarding home or residential treatment facility licensed by Washington state, where a fire-resistance rated corridor is required by Table 1017.1. The smoke barrier shall subdivide the floor into at least two compartments complying with Section 407.4.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1017, filed 12/19/06, effective 7/1/07.]

**WAC 51-50-1019 Number of exits and continuity.**

**1019.1 (IFC 1019.1) Exits from stories.** All spaces within each story shall have access to the minimum number of exits as specified in Table 1019.1 based on the occupant load of the story, except as modified in Section 1019.2. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories. The required number of exits from any story, including basements, shall be maintained until arrival at grade or the public way.

EXCEPTION: One means of egress is permitted within and from dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

**TABLE 1019.1 (IFC 1019.1)  
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD**

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

**1019.2 (IFC 1019.2) Buildings with one exit.** Only one exit shall be required in buildings as specified below:

1. Buildings meeting the limitations of Table 1019.2, provided the building has not more than one level below the first story above grade plane.
2. Buildings of Group R-3 Occupancy.
3. Single-level buildings with occupied spaces at the level of exit discharge provided each space complies with Section 1015.1 as a space with one exit or exit access doorway.

**TABLE 1019.2 (IFC 1019.2)  
BUILDINGS WITH ONE EXIT**

OCCUPANCY	MAXIMUM HEIGHT OF BUILDING ABOVE GRADE PLANE	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
A, B <sup>d</sup> , E <sup>c</sup> , F, M, U	1 Story	49 occupants and 75 feet travel distance
H-2, H-3	1 Story	3 occupants and 25 feet travel distance
H-4, H-5, I, R	1 Story	10 occupants and 75 feet travel distance
S <sup>a</sup>	1 Story	29 occupants and 100 feet travel distance
B <sup>b</sup> , F, M, S <sup>a</sup>	2 Stories	30 occupants and 75 feet travel distance

**TABLE 1019.2 (IFC 1019.2)  
BUILDINGS WITH ONE EXIT**

OCCUPANCY	MAXIMUM HEIGHT OF BUILDING ABOVE GRADE PLANE	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
R-2	2 Stories <sup>c</sup>	4 dwelling units and 50 feet travel distance

For SI: 1 foot = 304.8 mm.

a. For the required number of exits for open parking structures, see Section 1019.1.1.

b. For the required number of exits for air traffic control towers, see Section 412.1.

c. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1026 shall have a maximum height of three stories above grade plane.

d. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 with an occupancy in Group B shall have a maximum travel distance of 100 feet.

e. Day care maximum occupant load is 10.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1019, filed 12/19/06, effective 7/1/07.]

#### **WAC 51-50-1101 Section 1101—General.**

**1101.2 Design.** Buildings and facilities shall be designed and constructed to be accessible in accordance with this code and ICC A117.1, except those portions of ICC A117.1 amended by this section.

**1101.2.1 (ICC A117.1 Section 403) Landings for walking surfaces.** The maximum rise for any run is 30 inches (762 mm). Landings shall be provided at the top and bottom of any run. Landings shall be level and have a minimum dimension measured in the direction of travel of not less than 60 inches (1525 mm).

**1101.2.2 (ICC A117.1 Section 403.5) Clear width of accessible route.** Clear width of an accessible route shall comply with ICC A117.1 Table 403.5. For exterior routes of travel, the minimum clear width shall be 44 inches (1118 mm).

**1101.2.3 (ICC A117.1 Section 404.2.8) Door-opening force.** Fire doors shall have the minimum opening force allowable by the appropriate administrative authority. The force for pushing or pulling open doors other than fire doors shall be as follows:

1. Interior hinged door: 5.0 pounds (22.2 N) maximum
2. Interior sliding or folding doors: 5.0 pounds (22.2 N) maximum
3. Exterior hinged, sliding or folding door: 10 pounds (44.4 N) maximum.

**EXCEPTION:** Interior or exterior automatic doors complying with Section 404.3 of ICC ANSI A117.1.

These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.

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**1101.2.4 (ICC A117.1 Section 407.4.6.2.2) Arrangement of elevator car buttons.** This section is not adopted.

**1101.2.5 (ICC A117.1 603.4) Coat hooks and shelves.** Coat hooks shall be located within one of the reach ranges specified in Section 308. Shelves shall be installed so the top of the shelf is 40 inches (1015 mm) minimum and 42 inches maximum above the floor.

**1101.2.6 (ICC A117.1 604.11) Coat hooks and shelves.** Coat hooks provided within toilet compartments shall be located within one of the reach ranges specified in Section 308. Shelves shall be installed so the top of the shelf is 40 inches (1015 mm) minimum and 42 inches maximum above the floor.

**1101.2.7 (ICC ANSI A117.1 606.7) Operable parts.** Operable parts on drying equipment, towel or cleansing product dispensers, and disposal fixtures shall comply with Table 606.7, except the maximum reach height shall be 40 inches (1015 mm) for reach depths less than 6 inches.

**1101.2.8 (ICC A117.1 Section 604.6) Flush controls.** Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with Section 309, except the maximum height above the floor shall be 44 inches. Flush controls shall be located on the open side of the water closet.

**EXCEPTION:** In ambulatory accessible compartments complying with Section 604.9, flush controls shall be permitted to be located on either side of the water closet.

**1101.2.9 (ICC A117.1 Section 703.6.3.1) International Symbol of Accessibility.** Where the International Symbol of Accessibility is required, it shall be proportioned complying with ICC A117.1 Figure 703.6.3.1. All interior and exterior signs depicting the International Symbol of Accessibility shall be white on a blue background.

**1101.2.10 (ICC A117.1 Section 404.3.5) Control switches.** Manually operated control switches shall comply with Section 309, except they shall be placed 32 inches minimum (815 mm) and 40 inches maximum (1015 mm) above the floor. The clear floor space adjacent to the control switch shall be located beyond the arc of the door swing and centered on the control switch.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1101, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 05-24-070, § 51-50-1101, filed 12/5/05, effective 7/1/06; 05-01-014, § 51-50-1101, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1101, filed 12/17/03, effective 7/1/04.]

#### **WAC 51-50-1106 Section 1106—Parking and passenger loading facilities.**

**1106.3 Group I-1 and I-2 outpatient facilities.** Ten percent, but not less than one, of patient and visitor parking spaces provided to serve Group I-1 and I-2 outpatient facilities shall be accessible.

**1106.4 Rehabilitation facilities and outpatient physical therapy facilities.** Twenty percent, but not less than one, of the portion of patient and visitor parking spaces serving rehabilitation facilities specializing in treating conditions that



affect mobility and outpatient physical therapy facilities shall be accessible.

**1106.6 Location.** Accessible parking spaces shall be located on the shortest accessible route of travel from adjacent parking to an accessible building entrance. In parking facilities that do not serve a particular building, accessible parking spaces shall be located on the shortest route to an accessible pedestrian entrance to the parking facility. Where buildings have multiple accessible entrances with adjacent parking, accessible parking spaces shall be dispersed and located near the accessible entrances. Wherever practical, the accessible route shall not cross lanes of vehicular traffic. Where crossing traffic lanes is necessary, the route shall be designated and marked as a crosswalk.

EXCEPTION: 1. In multilevel parking structures, van accessible parking spaces are permitted on one level.  
2. Accessible parking spaces shall be permitted to be located in different parking facilities if substantially equivalent or greater accessibility is provided in terms of distance from an accessible entrance or entrances, parking fee and user convenience.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1106, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1106, filed 12/17/03, effective 7/1/04.]

#### **WAC 51-50-1107 Section 1107—Dwelling units and sleeping units.**

**1107.6 Group R.** Accessible units, Type A units and Type B units shall be provided in Group R Occupancies in accordance with Sections 1107.6.1 through 1107.6.4. Accessible and Type A units shall be apportioned among efficiency dwelling units, single bedroom units and multiple bedroom units, in proportion to the numbers of such units in the building.

**1107.6.2.1.1 Type A units.** In Group R-2 Occupancies containing more than 10 dwelling units or sleeping units, at least 5 percent, but not less than one, of the units shall be a Type A unit. All units on a site shall be considered to determine the total number of units and the required number of Type A units. Type A units shall be dispersed among the various classes of units.

EXCEPTIONS: 1. The number of Type A units is permitted to be reduced in accordance with Section 1107.7.  
2. Existing structures on a site shall not contribute to the total number of units on a site.

**1107.6.2.2 Group R-2 other than apartment houses, monasteries and convents.** In Group R-2 Occupancies, other than apartment houses, monasteries and convents, Accessible units and Type B units shall be provided in accordance with Sections 1107.6.2.2.1 and 1107.6.2.2.2. Accessible units shall be dispersed among the various classes of units.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1107, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1107, filed 12/17/03, effective 7/1/04.]

#### **WAC 51-50-1203 Section 1203—Ventilation.**

**1203.1 General.** Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical*

*Code* and the Washington State Ventilation and Indoor Air Quality Code.

**1203.4 Natural ventilation.** For other than Group R Occupancies in buildings four stories and less, natural ventilation of an occupied space shall be through windows, doors, louvers or other openings to the outdoors. The operating mechanism for such openings shall be provided with ready access so that the openings are readily controllable by the building occupants. Group R Occupancies in buildings four stories and less shall comply with the Washington State Ventilation and Indoor Air Quality Code.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1203, filed 12/17/03, effective 7/1/04.]

#### **WAC 51-50-1204 Section 1204—Temperature control.**

**1204.1 Equipment and systems.** Interior spaces intended for human occupancy shall be provided with active or passive space-heating systems capable of maintaining a minimum indoor temperature of 68°F (20°C) at a point 3 feet (914 mm) above the floor on the design heating day.

EXCEPTION: 1. Interior spaces where the primary purpose is not associated with human comfort.  
2. Group R-1 Occupancies not more than 500 square feet.

**1204.2.1 Definitions.** For the purposes of this section only, the following definitions apply.

**DESIGNATED AREAS** are those areas designated by a county to be an urban growth area in chapter 36.70A RCW and those areas designated by the U.S. Environmental Protection Agency as being in nonattainment for particulate matter.

**SUBSTANTIALLY REMODELED** means any alteration or restoration of a building exceeding 60 percent of the appraised value of such building within a 12-month period. For the purpose of this section, the appraised value is the estimated cost to replace the building and structure in-kind, based on current replacement costs.

**1204.2.2 Primary heating source.** Primary heating sources in all new and substantially remodeled buildings in designated areas shall not be dependent upon wood stoves.

**1204.2.3 Solid fuel burning devices.** No used solid fuel burning device shall be installed in new or existing buildings unless such device is United States Environmental Protection Agency certified or a pellet stove either certified or exempt from certification by the United States Environmental Protection Agency.

EXCEPTION: Antique wood cook stoves and heaters manufactured prior to 1940.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1204, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1204, filed 12/17/03, effective 7/1/04.]

#### **WAC 51-50-1208 Section 1208—Interior space dimensions.**

**1208.2 Minimum ceiling heights.** Occupiable spaces and habitable spaces shall have a ceiling height of not less than 7 feet 6 inches (2286 mm). Bathrooms, toilet rooms, kitchen,

storage rooms and laundry rooms shall be permitted to have a ceiling height of not less than 7 feet (2134 mm).

EXCEPTIONS: 1. In one- and two-family dwellings, beams or girders spaced not less than 4 feet (1219 mm) on center and projecting not more than 6 inches (152 mm) below the required ceiling height.  
2. If any room in a building has a sloped ceiling, the prescribed ceiling height for the room is required in one-half the area thereof. Any portion of the room measuring less than 5 feet (1524 mm) from the finished floor to the ceiling shall not be included in any computation of the minimum area thereof.  
3. Mezzanines constructed in accordance with Section 505.1.  
4. Residential Group R Occupancies shall be permitted to have a ceiling height of not less than 7 feet (2134 mm).

**1208.3 Room area.** Every dwelling unit shall have at least one room that shall have not less than 120 square feet (13.9 m<sup>2</sup>) of net floor area. Other habitable rooms shall have a net floor area of not less than 70 square feet (6.5 m<sup>2</sup>).

EXCEPTION: Every kitchen in a one- and two-family dwelling shall have not less than 50 square feet (4.64 m<sup>2</sup>) of gross floor area.

Portions of a room with a sloped ceiling measuring less than 5 feet (1524 mm) or a flat ceiling measuring less than 7 feet (2134 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum habitable area for that room.

[Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-1208, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1208, filed 12/17/03, effective 7/1/04.]

### WAC 51-50-1210 Section 1210—Surrounding materials.

**1210.5 Toilet rooms.** This section is not adopted.

(The requirements of this section have been moved to Section 2902.2.1.1)

[Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-1210, filed 12/2/04, effective 7/1/05.]

### WAC 51-50-1405 Section 1405—Installation of wall coverings.

**1405.5.2 Seismic requirements.** Anchored masonry veneer located in Seismic Design Category C, D, E, or F shall conform to the requirements of Section 6.2.2.10, except Section 6.2.2.10.3.2, of ACI 530/ASCE 5/TMS 402.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1405, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-1405, filed 12/2/04, effective 7/1/05.]

### WAC 51-50-1602 Section 1602—Definitions and notations.

**BALCONY, EXTERIOR.** This definition is not adopted.

**DECK.** This definition is not adopted.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1602, filed 12/19/06, effective 7/1/07.]

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### WAC 51-50-1607 Section 1607—Live loads.

#### IBC Table 1607.1 MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS AND MINIMUM CONCENTRATED LIVE LOADS

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (psf)
5. (Reserved)		_____
9. Decks <sup>h</sup> and Balconies	Same as occupancy served	_____
28. Residential One- and two-family dwellings		
Uninhabitable attics without storage <sup>i</sup>	10	
Uninhabitable attics with limited storage <sup>i, j</sup>	20	
Habitable attics and sleeping areas	30	_____
All other areas	40	
Hotels and multifamily dwellings		
Private rooms and corridors serving them	40	
Public rooms and corridors serving them	100	

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1607, filed 12/19/06, effective 7/1/07.]

### WAC 51-50-1702 Section 1702—Definitions.

#### 1702.1 General.

**SMALL BUSINESS.** Any business entity (including a sole proprietorship, corporation, partnership or other legal entity) which is owned and operated independently from all other businesses, which has the purpose of making a profit, and which has fifty or fewer employees, or which has a million dollars or less per year in gross sales, of window and door products.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1702, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1702, filed 12/17/03, effective 7/1/04.]

### WAC 51-50-1714 Section 1714—Preconstruction load tests.

**1714.5 Exterior window and door assemblies.** The design pressure rating of exterior windows and doors in buildings shall be determined in accordance with Section 1714.5.1 or 1714.5.2.

EXCEPTION: 1. Structural wind load design pressures for window units smaller than the size tested in accordance with Section 1714.5.1 or 1714.5.2 shall be permitted to be higher than the design value of the tested unit provided such higher pressures are determined by accepted engineering analysis. All components of the small unit shall be the same as the tested unit. Where such calculated design pressures are used, they shall be validated by an additional test of the window unit having the highest allowable design pressure.  
2. Custom exterior windows and doors manufactured by a small business shall be exempt from all testing requirements in Section 1714 of the International Building Code provided they meet the applicable provisions of Chapter 24 of the International Building Code.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1714, filed 12/19/06, effective 7/1/07.]

**WAC 51-50-2106 Section 2106—Seismic design.**

**2106.1.1 Basic seismic-force-resisting system.** Buildings relying on masonry shear walls as part of the basic seismic-force-resisting system shall comply with Section 1.14.2.2 of ACI 530/ASCE 5/TMS 402 or with Section 2106.1.1.1, 2106.1.1.2, or 2106.1.1.3.

**EXCEPTION:** Special reinforced masonry shear walls are not required to comply with Section 1.14.2.2.5(a) of ACI 530/ASCE 5/TMS 420 (MSJC-05), provided the masonry resists the calculated shear without shear reinforcement.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-2106, filed 12/19/06, effective 7/1/07.]

**WAC 51-50-2108 Section 2108—Strength design of masonry.**

**2108.2 ACI 530/ASCE 5/TMS 402, Section 3.1.6.** Modify Section 3.1.6 as follows:

**3.1.6 Headed and bent-bar anchor bolts.** All embedded bolts shall be grouted in place, except that 1/4 inch (6.4 mm) diameter bolts are permitted to be placed in bed joints that are at least 1/2 inch (12.7 mm) in thickness.

[Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-2108, filed 12/2/04, effective 7/1/05.]

**WAC 51-50-2114 Section 2114—Emission standards.**

**2114.1 Emission Standards for Factory-built Fireplaces.** After January 1, 1997, no new or used factory-built fireplace shall be installed in Washington state unless it is certified and labeled in accordance with procedures and criteria specified in the Washington State Building Code Standard 31-2.

To certify an entire fireplace model line, the internal assembly shall be tested to determine its particulate matter emission performance. Retesting and recertifying is required if the design and construction specifications of the fireplace model line internal assembly change. Testing for certification shall be performed by a Washington state department of ecology (DOE) approved and U.S. Environmental Protection Agency (EPA) accredited laboratory.

**2114.2 Emission Standards for Certified Masonry and Concrete Fireplaces.** After January 1, 1997, new certified masonry or concrete fireplaces installed in Washington state shall be tested and labeled in accordance with procedures and criteria specified in the Washington State Building Code Standard 31-2.

To certify an entire fireplace model line, the internal assembly shall be tested to determine its particulate matter emission performance. Retesting and recertifying is required if the design and construction specifications of the fireplace model line internal assembly change. Testing for certification shall be performed by a Washington state department of ecology (DOE) approved and U.S. Environmental Protection Agency (EPA) accredited laboratory.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-2114, filed 12/17/03, effective 7/1/04.]

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**WAC 51-50-2900 Chapter 29—Plumbing systems.****SECTION 2901—PLUMBING CODE.**

Plumbing systems shall comply with the Plumbing Code.

**SECTION 2902—GENERAL.****2902.1 Number of fixtures.**

**2902.1.1 Requirements.** Plumbing fixtures shall be provided in the minimum number shown in Table 2902.1 and in this chapter. Where the proposed occupancy is not listed in Table 2902.1, the building official shall determine fixture requirements based on the occupancy which most nearly resembles the intended occupancy.

Plumbing fixtures need not be provided for unoccupied buildings or facilities.

**2902.1.2 Private offices.** Fixtures only accessible to private offices shall not be counted to determine compliance with this section.

**2902.1.3 Occupancy load distribution.** The occupant load shall be divided equally between the sexes, unless data approved by the building official indicates a different distribution of the sexes.

**2902.1.4 Food preparation areas.** In food preparation, serving and related storage areas, additional fixture requirements may be dictated by health codes.

**2902.1.5 Other requirements.** For other requirements for plumbing facilities, see Section 1210 and Chapter 11.

**2902.2 Access to fixtures.**

**2902.2.1 Location.** Plumbing fixtures shall be located in each building or conveniently in a building adjacent thereto on the same property.

**2902.2.1.1 Toilet rooms.** Toilet rooms shall not open directly into a room used for the preparation of food for service to the public or residents of Group R-2 boarding homes and residential treatment facilities licensed by Washington state.

**2902.2.2 Multiple tenants.** Access to toilets serving multiple tenants shall be through a common use area and not through an area controlled by a tenant.

**2902.2.3 Multistory buildings.** Required fixtures shall not be located more than one vertical story above or below the area served.

**2902.3 Separate facilities.**

**2902.3.1 Requirements.** Separate toilet facilities shall be provided for each sex.

**EXCEPTION:** In occupancies serving 15 or fewer persons, one toilet facility designed for use by no more than one person at a time shall be permitted for use by both sexes.

**2902.3.2 Food service establishments.** When customers and employees share the same facilities, customers accessing the facilities are excluded from food preparation and storage areas.

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**2902.4 Pay facilities.** Required facilities shall be free of charge. Where pay facilities are installed, they shall be in addition to the minimum required facilities.

**2902.5** is not adopted.

**2902.6** is not adopted.

#### SECTION 2903—SPECIAL PROVISIONS.

**2903.1 Dwelling units.** Dwelling units shall be provided with a kitchen sink.

**2903.2 Water closet space requirements.** The water closet stool in all occupancies shall be located in a clear space not less than 30 inches (762 mm) in width, with a clear space in front of the stool of not less than 24 inches (610 mm).

**2903.3 Water.** Each required sink, lavatory, bathtub and shower stall shall be equipped with hot and cold running water necessary for its normal operation.

#### 2903.4 Drinking fountains.

**2903.4.1 Number.** Occupant loads over 30 shall have one drinking fountain for the first 150 occupants, then one per each additional 500 occupants.

EXCEPTIONS: 1. Sporting facilities with concessions serving drinks shall have one drinking fountain for each 1000 occupants.  
2. A drinking fountain need not be provided in a drinking or dining establishment.

**2903.4.2 Multistory buildings.** Drinking fountains shall be provided on each floor having more than 30 occupants in schools, dormitories, auditoriums, theaters, offices and public buildings.

**2903.4.3 Penal institutions.** Penal institutions shall have one drinking fountain on each cell block floor and one on each exercise floor.

**2903.4.4 Location.** Drinking fountains shall not be located in toilet rooms.

TABLE 2902.1—MINIMUM PLUMBING FIXTURES<sup>1,2,4,6</sup>

TYPE OF BUILDING OR OCCUPANCY <sup>8</sup>	WATER CLOSETS (fixtures per person)		LAVATORIES <sup>5</sup> (fixtures per person)		BATHTUB OR SHOWER (fixtures per person)
	MALE <sup>3</sup>	FEMALE	MALE	FEMALE	
For the occupancies listed below, use 30 square feet (2.79 m <sup>2</sup> ) per occupant for the minimum number of plumbing fixtures.					
<b>Group A</b> <b>Assembly places—</b> Conference rooms, dining rooms, drinking establishments, exhibit rooms, gymnasiums, lounges, stages and similar uses including restaurants classified as Group B Occupancies	1:1-25 2:26-75 3:76-125 4:126-200 5:201-300 6:301-400 Over 400, add one fixture for each additional 200 males or 150 females	1:1-25 2:26-75 3:76-125 4:126-200 5:201-300 6:301-400	One per 2 water closets		
For the assembly occupancies listed below, use the number of fixed seating or, where no fixed seating is provided, use 15 square feet (1.39 m <sup>2</sup> ) per occupant for the minimum number of plumbing fixtures.					
Assembly places— <sup>9</sup> Theaters, auditoriums, convention halls, dance floors, lodge rooms, casinos, and such places which have limited time for fixture use (intermissions)	1:1-100 2:101-200 3:201-400 Over 400, add one fixture for each additional 250 males or 50 females	One per 25 Up to 400	1:1-200 2:201-400 3:401-750 Over 750, add one fixture for each additional 500 persons	1:1-200 2:201-400 3:401-750	
Assembly places— Stadiums, arena and other sporting facilities where fixture use is not limited to intermissions	1:1-100 2:101-200 3:201-400 Over 400, add one fixture for each additional 300 males or 100 females	One per 50 Up to 400	1:1-200 2:201-400 3:401-750 Over 750, add one fixture for each additional 500 persons	1:1-200 2:201-400 3:401-750	
For the assembly occupancies listed below, use the number of fixed seating or, where no fixed seating is provided, use 30 square feet (2.79 m <sup>2</sup> ) per occupant for the minimum number of plumbing fixtures.					
Worship places Principal assembly area Educational & activity unit	One per 150 One per 125	One per 75 One per 75	One per 2 water closets One per 2 water closets		
For the occupancies listed below, use 200 square feet (18.58 m <sup>2</sup> ) per occupant for the minimum number of plumbing fixtures.					

TABLE 2902.1—MINIMUM PLUMBING FIXTURES<sup>1,2,4,6</sup>

TYPE OF BUILDING OR OCCUPANCY <sup>8</sup>	WATER CLOSETS (fixtures per person)		LAVATORIES <sup>5</sup> (fixtures per person)		BATHTUB OR SHOWER (fixtures per person)
	MALE <sup>3</sup>	FEMALE	MALE	FEMALE	
<b>Group B</b> and other clerical or administrative employee accessory use	1:1-15 2:16-35 3:36-55 Over 55, add one for each additional 50 persons	1:1-15 2:16-35 3:36-55	One per 2 water closets		
For the occupancies listed below, use 100 square feet ( 9.3 m <sup>2</sup> ) per student for the minimum number of plumbing fixtures.					
<b>Group E</b> Schools - for staff use All schools (One staff per 20 students)  Schools - for student use Day care  Elementary Secondary	1:1-15 2:16-35 3:36-55 Over 55, add one fixture for each additional 40 persons  1:1-20 2:21-50 Over 50, add one fixture for each additional 50 persons One per 30 One per 40	1:1-15 2:16-35 3:36-55  1:1-20 2:21-50  One per 25 One per 30	One per 2 water closets    1:1-20 2:21-50 Over 50, add one fixture for each additional 50 persons One per 2 water closets One per 2 water closets		
For the occupancies listed below, use 50 square feet (4.65 m <sup>2</sup> ) per occupant for the minimum number of plumbing fixtures.					
<b>Education facilities other than Group E</b> Others (colleges, universities, adult centers, etc.)	One per 40	One per 25	One per 2 water closets		
For the occupancies listed below, use 2,000 square feet (185.8 m <sup>2</sup> ) per occupant for the minimum number of plumbing fixtures.					
<b>Group F and Group H</b> Workshop, foundries and similar establishments, and hazardous occupancies	1:1-10 2:11-25 3:26-50  4:51-75 5:76-100 Over 100, add one fixture for each additional 30 persons	1:1-10 2:11-25 3:26-50	One per 2 water closets		One shower for each 15 persons exposed to excessive heat or to skin contamination with irritating materials
For the occupancies listed below, use the designated application and 200 square feet (18.58 m <sup>2</sup> ) per occupant of the general use area for the minimum number of plumbing fixtures.					
<b>Group I<sup>7</sup></b> Hospital waiting rooms  Hospital general use areas	One per room (usable by either sex)  1:1-15 2:16-35 3:36-55 Over 55, add one fixture for each additional 40 persons	1:1-15 3:16-35 3:36-55	One per room  One per 2 water closets		
Hospital patient rooms: Single Bed	One adjacent to and directly accessible from		One per toilet room		One per toilet room
Isolation	One adjacent to and directly accessible from		One per toilet room		One per toilet room
Multibed	One per 4 patients		One per 4 patients		One per 8 patients
Long-term	One per 4 patients		One per 4 patients		One per 15 patients
Jails and reformatories Cell	One per cell		One per cell		
Exercise room	One per exercise room		One per exercise room		
Other institutions (on each occupied floor)	One per 25	One per 25	One per 2 water closets		One per 8
For the occupancies listed below, use 200 square feet (18.58 m <sup>2</sup> ) per occupant for the minimum number of plumbing fixtures.					

TABLE 2902.1—MINIMUM PLUMBING FIXTURES<sup>1,2,4,6</sup>

TYPE OF BUILDING OR OCCUPANCY <sup>8</sup>	WATER CLOSETS (fixtures per person)		LAVATORIES <sup>5</sup> (fixtures per person)		BATHTUB OR SHOWER (fixtures per person)
	MALE <sup>3</sup>	FEMALE	MALE	FEMALE	
<b>Group M</b> Retail or wholesale stores	1:1-50 2:51-100 3:101-400 4:201-300 5:301-400 Over 400, add one fixture for each additional 300 males or 150 females	1:1-50 2:51-100 3:101-200 4:201-300 5:301-400	One per 2 water closets		
For Group R Occupancies containing dwelling units or guest rooms, use the table below. For dormitories, use 200 square feet (18.58 m <sup>2</sup> ) per occupant for the minimum number of plumbing fixtures.					
<b>Group R</b> Dwelling units Hotel, motel, and boarding house guest rooms	One per dwelling unit One per guest room		One per dwelling unit One per guest room		One per dwelling unit One per guest room
Boarding homes licensed by the department of social and health services	One per 8	One per 8	One per 8	One per 8	One per 12
Dormitories	One per 10 Over 10, add one fixture for each additional 25 males and over 8, add one for each additional 20 females	One per 8	One per 12 Over 12, add one fixture for each additional 20 males and one for each additional 15 females	One per 12	One per 8 For females, add one additional unit per each additional 30. Over 150 persons, add one additional unit per each additional 20 persons
For the occupancies listed below, use 5,000 square feet (464.5 m <sup>2</sup> ) per occupant for the minimum number of plumbing fixtures.					
<b>Group S</b>      Warehouses	1:1-10      2:11-25 3:26-50 4:51-75 5:76-100 Over 100, add one for each 30 persons	1:1-10	One per 40 occupants of each sex		One shower for each 15 persons exposed to excessive heat or to skin contamination with poisonous, infectious or irritating materials

<sup>1</sup>The figures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction thereof.

<sup>2</sup>For occupancies not shown, see Section 2902.1.1.

<sup>3</sup>Where urinals are provided, one water closet less than the number specified may be provided for each urinal installed, except the number of water closets in such cases shall not be reduced to less than one quarter (25%) of the minimum specified. For men's facilities serving 26 or more persons, not less than one urinal shall be provided.

<sup>4</sup>For drinking fountains, see Section 2903.4.

<sup>5</sup>Twenty-four inches (610 mm) of wash sink or 18 inches (457 mm) of a circular basin, when provided with water outlets for such space, shall be considered equivalent to one lavatory.

<sup>6</sup>For when a facility may be usable by either sex, see Section 2902.3.1.

<sup>7</sup>See WAC 246-320 for definitions, other fixtures and equipment for hospitals.

<sup>8</sup>When a space is accessory to or included as a part of a different occupancy group per Chapter 3, the area per occupant for the minimum plumbing fixture number is to be determined by its own specific use or purpose, not by that of the building's occupancy group.

<sup>9</sup>In multiplex movie theaters, where shows are scheduled at different times, the number of occupants for toilet fixture use may be based upon one-half (50%) of the total in all the auditoriums, but no less than the number in the largest auditorium.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-2900, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-2900, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-2900, filed 12/17/03, effective 7/1/04.]

### WAC 51-50-3001 Section 3001—General.

**3001.1 Scope.** This chapter governs the design, construction, installation, alteration and repair of elevators and conveying systems and their components.

**3001.2 Referenced standards.** Except as otherwise provided for in this code, the design, construction, installation, alteration, repair and maintenance of elevators and conveying systems and their components shall conform to ASME A17.1, ASME A90.1, ASME B20.1, ALI ALCTV, and ASCE 24 for construction in flood hazard areas established in Section 1612.3.

**3001.3 Accessibility.** Passenger elevators required to be accessible by Chapter 11 shall conform to ICC A117.1.

**3001.4 Change in use.** A change in use of an elevator from freight to passenger, passenger to freight, or from one freight class to another freight class shall comply with Part XII of ASME A17.1.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-3001, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-3001, filed 12/17/03, effective 7/1/04.]

#### **WAC 51-50-3004 Section 3004—Hoistway venting.**

**3004.3 Area of vents.** Except as provided for in Section 3004.3.1, the area of the vents shall not be less than 3 1/2 percent of the area of the hoistway nor less than 3 square feet (0.28 m<sup>2</sup>) for each elevator car, and not less than 3 1/2 percent nor less than 0.5 square feet (0.047 m<sup>2</sup>) for each dumbwaiter car in the hoistway, whichever is greater. The total required vent area shall be equipped with dampers that remain powered closed until activated open by the fire alarm system panel. The dampers shall open upon loss of power.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-3004, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-3004, filed 12/17/03, effective 7/1/04.]

CFM = BTU output of elevator machine room equipment / [1.08 x (acceptable machine room temp - make up air temp)]

**EXCEPTION:** For buildings four stories or less, natural or mechanical means may be used in lieu of an independent ventilation or air-conditioning system to keep the equipment space ambient air temperature and humidity in the range specified by the elevator equipment manufacturer.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-3006, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-3006, filed 12/17/03, effective 7/1/04.]

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

#### **WAC 51-50-3103 Temporary structures.**

**3103.1 General.** The provisions of this section shall apply to structures erected for a period of less than one hundred eighty days. Tents and other membrane structures erected for a period of less than one hundred eighty days shall comply with the *International Fire Code*. Those erected for a longer period of time shall comply with applicable sections of this code.

**EXCEPTION:** The building official may authorize unheated tents and yurts under five hundred square feet accommodating an R-1 Occupancy for recreational use as a temporary structure and allow them to be used indefinitely.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-3103, filed 12/19/06, effective 7/1/07.]

#### **WAC 51-50-3109 Section 3109—Swimming pool enclosures and safety devices.**

**3109.3 Public swimming pools.** This section is not adopted. Public swimming pool barriers are regulated by WAC 246-260-031(4).

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-3109, filed 12/19/06, effective 7/1/07.]

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#### **WAC 51-50-3006 Section 3006—Machine rooms.**

**3006.2 Venting.** Machinery spaces, machine rooms, control spaces, and control rooms that contain solid-state equipment for elevator operation shall be provided with an independent ventilation or air-conditioning system to protect against the overheating of the electrical equipment. Ventilation systems shall use outdoor make up air. The system shall service the equipment space only, and shall be capable of maintaining the temperature and humidity within the range established by the manufacturer's specifications. Where no manufacturer specifications are available, the equipment space temperature shall be maintained at no less than fifty-five degrees Fahrenheit and no more than ninety degrees Fahrenheit.

The cooling load for the equipment shall include the BTU output of the elevator operation equipment as specified by the manufacturer based on one hour of continuous operation. The outdoor design temperature for ventilation shall be from the 0.5% column for summer from the Puget Sound Chapter of ASHRAE publication "*Recommended Outdoor Design Temperatures, Washington State*." The following formula shall be used to calculate flow rate for ventilation:

#### **WAC 51-50-31200 Section 31-2—Standard test method for particulate emissions from fireplaces.**

##### **Washington State Building Code Standard 31-2 STANDARD TEST METHOD FOR PARTICULATE EMISSIONS FROM FIREPLACES (Insert following page 596)**

**See Section 2114, *International Building Code***

##### **SECTION 31.200—TITLE AND SCOPE.**

###### **SECTION 31.200.1 TITLE.**

This Appendix Chapter 31-2 shall be known as the "Washington state standard test method for particulate emissions from fireplaces" and may be cited as such; and will be referred to herein as "this standard."

###### **SECTION 31.200.2 SCOPE.**

This standard covers emissions performance, approval/certification procedures, test laboratory accreditation, recordkeeping, reporting requirements, and the test protocol for measuring particulate emissions from fireplaces.

All testing, reporting and inspection requirements of this standard shall be conducted by a Washington state department of ecology (DOE) approved testing laboratory. In order to qualify for DOE approval, the test laboratory must be a U.S. Environmental Protection Agency (EPA) accredited laboratory (40 CFR Part 60, Subpart AAA). DOE may approve a test laboratory upon submittal of the following information:

1. A copy of their U.S. EPA accreditation certificate; and
2. A description of their facilities, test equipment, and test-personnel qualifications including education and work experience.

DOE may revoke a test laboratory approval when the test laboratory is no longer accredited by the U.S. EPA or if DOE

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determines that the test laboratory does not adhere to the testing requirements of this chapter.

#### SECTION 31.201—DEFINITIONS.

For the purpose of this standard certain terms are defined as follows:

**ANALYZER CALIBRATION ERROR** is the difference between the gas concentration exhibited by the gas analyzer and the known concentration of the calibration gas when the calibration gas is introduced directly to the analyzer.

**BURN RATE** is the average rate at which test-fuel is consumed in a fireplace measured in kilograms of wood (dry basis) per hour (kg/hr) during a test-burn.

**CALIBRATION DRIFT** is the difference in the analyzer reading from the initial calibration response at a mid-range calibration value after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place.

**CALIBRATION GAS** is a known concentration of carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), or oxygen (O<sub>2</sub>) in nitrogen (N<sub>2</sub>).

**CERTIFICATION OR AUDIT TEST** is the completion of at least one, three-fuel-load test-burn cycle in accordance with Section 31.202.

**FIREBOX** is the chamber in the fireplace in which a test-fuel charge(s) is placed and combusted.

**FIREPLACE** is a wood burning device which is exempt from U.S. EPA 40 CFR Part 60, Subpart AAA and:

1. Is not a cookstove, boiler, furnace, or pellet stove as defined in 40 CFR Part 60, Subpart AAA; and
2. Is not a masonry heater as defined in Section 31.201.

**FACTORY-BUILT FIREPLACE** is a listed assembly of a fire chamber, its chimney and related factory-made parts designed for unit assembly without requiring field construction. Factory-built fireplaces are not dependent on mortar-filled joints for continued safe use.

**MASONRY FIREPLACE** is a hearth and fire chamber of solid masonry units such as bricks, stones, masonry units or reinforced concrete provided with a suitable chimney.

**FIREPLACE, CERTIFIED**, is a fireplace that meets the emission performance standards when tested according to Washington State Building Code Standard 31-2.

**FIREPLACE, NONCERTIFIED**, (masonry or concrete) is any fireplace that is not a certified fireplace. A noncertified fireplace will be subject to applicable burn ban restrictions.

**FIREPLACE DESIGN** is the construction and/or fabrication specifications including all dimensions and materials required for manufacturing or building fireplaces with identical combustion function and particulate emissions factors.

**FIREPLACE MODEL LINE** is a series of fireplace models which all have the same internal assembly. Each model in a model line may have different facade designs and external decorative features.

**INTERNAL ASSEMBLY** is the core construction and firebox design which produces the same function and emissions factor for a fireplace model line.

**MASONRY HEATER** is a heating system of predominantly masonry construction having a mass of at least 800 kg (1760 lbs), excluding the chimney and foundation, which is designed to absorb a substantial portion of the heat energy from a rapidly burned charge of solid fuel by:

1. Routing of exhaust gases through internal heat exchange channels in which the flow path downstream of the firebox includes at least one 180 degree change in flow direction, usually downward, before entering the chimney; and
2. Being constructed of sufficient mass such that under normal operating conditions the external surface of the heater, except in the region immediately surrounding the fuel loading door(s), does not exceed 110°C (230°F).

Masonry heaters shall be listed or installed in accordance with ASTM E-1602.

**RESPONSE TIME** is the amount of time required for the measurement system to display 95 percent of a step change in gas concentration.

**SAMPLING SYSTEM BIAS** is the difference between the gas concentrations exhibited by the analyzer when a known concentration gas is introduced at the outlet of the sampling probe and when the sample gas is introduced directly to the analyzer.

**SPAN** is the upper limit of the gas concentration measurement range (25 percent for CO<sub>2</sub>, O<sub>2</sub>, and 5 percent for CO).

**TEST FACILITY** is the area in which the fireplace is installed, operated, and sampled for emissions.

**TEST FUEL LOADING DENSITY** is the weight of the as-fired test-fuel charge per unit area of usable firebox floor (or hearth).

**TEST-BURN** is an individual emission test which encompasses the time required to consume the mass of three consecutively burned test-fuel charges.

**TEST-FUEL CHARGE** is the collection of test fuel pieces placed in the fireplace at the start of certification test.

**USABLE FIREBOX AREA** is the floor (or hearth) area, within the fire chamber of a fireplace upon which a fire may be, or is intended to be built. Usable firebox area is calculated using the following definitions:

1. Length. The longest horizontal fire chamber dimension along the floor of the firebox that is parallel to a wall of the fire chamber.
2. Width. The shortest horizontal fire chamber dimension along the floor of the firebox that is parallel to a wall of the fire chamber.
3. For angled or curved firebox walls and/or sides, the effective usable firebox area shall be determined by calculating the sum of standard geometric areas or subareas of the firebox floor.

If a fireplace has a floor area within the fire chamber which is larger than the area upon which it is intended that fuel be placed and burned, the usable firebox area shall be calculated as the sum of standard geometric areas or sub-



areas of the area intended for fuel placement and burning. For fireplace grates which elevate the fuel above the firebox floor, usable firebox area determined in this manner shall be multiplied by a factor of 1.5. The weight of test-fuel charges for fireplace-grate usable-firebox-area tests, shall not exceed the weight of test-fuel charges determined for the entire fireplace floor area.

**ZERO DRIFT** is the difference in the analyzer reading from the initial calibration response at the zero concentration level after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place.

#### SECTION 31.202—TESTING.

**31.202.1 Applicability.** This method is applicable for the certification and auditing of fireplace particulate emission factors. This method describes the test facility, fireplace installation requirements, test-fuel charges, and fireplace operation as well as procedures for determining burn rates and particulate emission factors.

**31.202.2 Principle.** Particulate matter emissions are measured from a fireplace burning prepared test-fuel charges in a test facility maintained at a set of prescribed conditions.

#### 31.202.3 Test apparatus.

**31.202.3.1 Fireplace temperature monitors.** Devices capable of measuring flue-gas temperature to within 1.5 percent of expected absolute temperatures.

**31.202.3.2 Test facility temperature monitor.** A thermocouple located centrally in a vertically oriented pipe shield 6 inches (150 mm) long, 2 inches (50 mm) diameter that is open at both ends, capable of measuring air temperature to within 1.5 percent of expected absolute temperatures.

**31.202.3.3 Balance.** Balance capable of weighing the test-fuel charge(s) to within 0.1 lb (0.05 kg).

**31.202.3.4 Moisture meter.** Calibrated electrical resistance meter for measuring test-fuel moisture to within 1 percent moisture content (dry basis).

**31.202.3.5 Anemometer.** Device capable of detecting air velocities less than 20 ft/min (0.10 m/sec), for measuring air velocities near the fireplace being tested.

**31.202.3.6 Barometer.** Mercury, aneroid or other barometer capable of measuring atmospheric pressure to within 0.1 inch Hg (2.5 mm Hg).

**31.202.3.7 Draft gauge.** Electromanometer or other device for the determination of flue draft (i.e., static pressure) readable to within 0.002 inches of water column (0.50 Pa).

**31.202.3.8 Combustion gas analyzer.** Combustion gas analyzers for measuring carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), and oxygen (O<sub>2</sub>) in the fireplace exhaust-gas stream must meet all of the following measurement system performance specifications:

1. **Analyzer calibration error.** Shall be less than  $\pm 2$  percent of the span value for the zero, mid-range, and high-range calibration gases.

2. **Sampling system bias.** Shall be less than  $\pm 5$  percent of the span value for the zero, mid-range, and high-range calibration gases.

3. **Zero Drift.** Shall be less than  $\pm 3$  percent of the span over the period of each run.

4. **Calibration drift.** Shall be less than  $\pm 3$  percent of the span value over the period of each run.

5. **Response time.** Shall be less than 1.5 minutes.

**31.202.4 Emissions sampling method.** Use the emission sampler system (ESS) as described in Section 31.203.12 or an equivalent method as determined by the application of the U.S. EPA Method 301 Validation Procedure (Federal Register, December 12, 1992, Volume 57, Number 250, page 11,998) and upon approval of DOE.

**31.202.5 Fireplace installation and test facility requirements.** The fireplace being tested must be constructed, if site-built, or installed, if manufactured, in accordance with the designer's/manufacture's written instructions. The chimney shall have a total vertical height above the base of the fire chamber of not less than 15 feet (4 600 mm). The fireplace chimney exit to the atmosphere must be freely communicating with the fireplace combustion makeup-air source. There shall be no artificial atmospheric pressure differential imposed between the chimney exit to the atmosphere and the fireplace makeup-air inlet.

**31.202.6 Fireplace aging and curing.** A fireplace of any type shall be aged before certification testing begins. The aging procedure shall be conducted and documented by the testing laboratory.

**31.202.6.1 Catalyst-equipped fireplaces.** Operate the catalyst-equipped fireplace using fuel described in Section 31.203. Operate the fireplace with a new catalytic combustor in place and in operation for at least 50 hours. Record and report hourly catalyst exit temperatures, the hours of operation, and the weight of all fuel used.

**31.202.6.2 Noncatalyst-equipped fireplaces.** Operate the fireplace using the fuel described in Section 31.203 for at least 10 hours. Record and report the hours of operation and weight of all fuel used.

**31.202.7 Pretest preparation.** Record the test-fuel charge dimensions, moisture content, weights, and fireplace (and catalyst if equipped) descriptions.

The fireplace description shall include photographs showing all externally observable features and drawings showing all internal and external dimensions needed for fabrication and/or construction. The drawings must be verified as representing the fireplace being tested and signed by an authorized representative of the testing laboratory.

**31.202.8 Test facility conditions.** Locate the test facility temperature monitor on the horizontal plane that includes the primary air intake opening for the fireplace. Locate the temperature monitor 3 to 6 feet (1 000 to 2 000 mm) from the front of the fireplace in the 90° sector in front of the fireplace. Test facility temperatures shall be maintained between 65° and 90°F (18° and 32°C). Use an anemometer to measure the air velocity. Measure and record the room-air velocity within

2 feet (600 mm) of the test fireplace before test initiation and once immediately following the test-burn completion. Air velocity shall be less than 50 feet/minute (250 mm/second) without the fireplace operating.

#### SECTION 31.203—TEST PROTOCOL.

**31.203.1 Test fuel.** Fuel shall be air dried Douglas fir dimensional lumber or cordwood without naturally associated bark. Fuel pieces shall not be less than 1/2 nor more than 5/6 of the length of the average fire chamber width. Fuel shall be split or cut into pieces with no cross-sectional dimension greater than 6 inches (152 mm). Spacers, if used, shall not exceed 3/4 inches (19 mm) in thickness and 15 percent of the test-fuel charge weight. Fuel moisture shall be in the range of 16 to 20 percent (wet basis) or 19 to 25 percent (dry basis) meter reading.

**31.203.2 Test-fuel loading density.** The wet (with moisture) minimum weight of each test-fuel charge shall be calculated by multiplying the hearth area in square feet by 7.0 pounds per square foot (square meters x 0.30 kg/m<sup>2</sup>) (± 10 percent). Three test-fuel charges shall be prepared for each test-burn.

**31.203.3 Kindling.** The initial test-fuel charge of the three test-fuel charge test-burn shall be started by using a kindling-fuel charge which is up to 50 percent of the first test-fuel charge weight. Kindling-fuel pieces can be any size needed to start the fire or whatever is recommended in the manufacturer's (builder's) instructions to consumers. The kindling-fuel charge weight is not part of the initial test-fuel charge weight but is in addition to it.

**31.203.4 Test-burn ignition.** The fire can be started with or without paper. If used, the weight of the paper must be included in test-fuel charge weight. The remainder of the test-fuel charge may be added at any time after kindling ignition except that the entire first test-fuel charge must be added within 10 minutes after the start of the test (i.e., the time at which the flue-gas temperature at the 8-foot (2 440 mm) level is over 25°F (14°C) greater than the ambient temperature of the test facility).

**31.203.5 Test initiation.** Emissions and flue-gas sampling are initiated immediately after the kindling has been ignited and when flue-gas temperatures in the center of the flue at an elevation of 8 feet (2 440 mm) above the base (floor) of the fire chamber reach 25°F (14°C) greater than the ambient temperature of the test facility.

**31.203.6 Sampling parameters.** Sampling (from the 8-foot (2 440 mm) flue-gas temperature measurement location) must include:

1. Particulate emissions
2. Carbon dioxide (CO<sub>2</sub>)<sup>1</sup>
3. Carbon monoxide (CO)<sup>1</sup>
4. Oxygen (O<sub>2</sub>)<sup>1</sup>
5. Temperature(s)

<sup>1</sup>These gases shall be measured on-line (real-time) and recorded at a frequency of not less than once every 5 minutes. These 5-minute readings are to be arithmetically averaged over the test-burn series or alternatively, a gas bag sample can be taken at a constant sample rate over the entire test-

burn series and analyzed for the required gases within one hour of the end of the test-burn.

If a fireplace is equipped with an emissions control device which is located downstream from the 8-foot (2 440 mm) flue-gas temperature measurement location, a second temperature, particulate, and gaseous emissions sampling location must be located downstream from the emissions control device but not less than 4 flue diameters upstream from the flue exit to the atmosphere. The two sampling locations must be sampled simultaneously during testing for each fireplace configuration being tested.

**31.203.7 Test-fuel additions and test completion.** The second and third test-fuel charges for a test-burn may be placed and burned in the fire chamber at any time deemed reasonable by the operator or when recommended by the manufacturer's and/or builder's instructions to consumers.

No additional kindling may be added after the start of a test-burn series and the flue-gas temperature at the 8-foot (2 440 mm) level above the base of the hearth must always be 25°F (14°C) greater than the ambient temperature of the test facility for a valid test-burn series. Each entire test-fuel charge must be added within 10 minutes from the addition of the first piece.

A test (i.e., a three test-fuel charge test-burn series) is completed and all sampling and measurements are stopped when all three test-fuel charges have been consumed (to more than 90 percent by weight) in the firebox and the 8-foot (2 440 mm) level flue-gas temperature drops below 25°F (14°C) greater than the ambient temperature of the test facility. Within 5 minutes after the test-burn is completed and all measurements and sampling has stopped, the remaining coals and/or unburned fuel, shall be extinguished with a carbon dioxide fire extinguisher. All of the remaining coals, unburned fuel, and ash shall be removed from the firebox and weighed to the nearest 0.1 pound (0.05 kg). The weight of these unburned materials and ash shall be subtracted from the total test-burn fuel weight when calculating the test-burn burn rate. A test-burn is invalid if less than 90 percent of the weight of the total test-fuel charges plus the kindling weight have been consumed in the fireplace firebox.

**31.203.8 Test-fuel charge (load) adjustments.** Test-fuel charges may be adjusted (i.e., repositioned) once during the burning of each test-fuel charge. The time used to make this adjustment shall be less than 15 seconds.

**31.203.9 Air supply adjustment.** Air supply controls, if the fireplace is equipped with controls, may not be adjusted during any test-burn series after the first 10 minutes of startup of each fuel load. All air supply settings must be set to the lowest level at the start of a test and shall remain at the lowest setting throughout a test-burn.

**31.203.10 Auxiliary fireplace equipment operation.** Heat exchange blowers (standard or optional) sold with the fireplace shall be operated during all test-burns following the manufacturer's written instructions. If no manufacturer's written instructions are available, operate the heat exchange blower in the "high" position. (Automatically operated blowers shall be operated as designed.) Shaker grates, by-pass controls, afterburners, or other auxiliary equipment may be

adjusted only once per test-fuel charge following the manufacturer's written instructions. Record and report all adjustments on a fireplace operational written-record.

**31.203.11 Fireplace configurations.** One, 3 test-fuel charge test-burn shall be conducted for each of the following fireplace operating configurations:

1. Door(s) closed, with hearth grate;
2. Door(s) open, with hearth grate;
3. Door(s) closed, without hearth grate;
4. Door(s) open, without hearth grate; and
5. With no door(s), and draft inducer on.

No test-burn series is necessary for any configuration the appliance design cannot or is not intended to accommodate. If a configuration is not tested, the reason must be submitted with the test report and the appliance label must state that the appliance cannot be used in that configuration by consumer users.

One emission factor result, or one emission factor average, as provided in Section 31.203.11.2, from each fireplace configuration tested shall be compiled into an arithmetic average of all the configurations tested for determining compliance with the requirements of Section 31.204.2.

**31.203.11.1 Closed-door(s) testing.** For all closed-door test configurations, the door(s) must be closed within 10 minutes from the addition of the first test-fuel piece of each test-fuel charge in a test-burn. During a test-burn, the door(s) cannot be reopened except during test-fuel reload and adjustment as referenced in Sections 31.203.7 and 31.203.8.

**31.203.11.2 Additional test-burn.** The testing laboratory may conduct more than one test-burn series for each of the applicable configurations specified in Section 31.203.11. If more than one test-burn is conducted for a specified configuration, the results from at least 2/3 of the test-burns for that configuration shall be used in calculating the arithmetic average emission factor for that configuration. The measurement data and results of all tests conducted shall be reported regardless of which values are used in calculating the average emission factor for that configuration.

### **31.203.12 Emissions sampling system (ESS).**

**31.203.12.1 Principle.** Figure 31-2-1 shows a schematic of an ESS for sampling solid-fuel-fired fireplace emissions. Except as specified in Section 31.202.4, an ESS in this configuration shall be used to sample all fireplace emissions. The ESS shall draw flue gases through a 15-inch (380 mm) long, 3/8-inch (10 mm) O.D. stainless steel probe which samples from the center of the flue at an elevation which is 8 feet (2 440 mm) above the floor of the firebox (i.e., the hearth). A flue-gas sample shall then travel through a 3/8-inch (10 mm) O.D. Teflon® tube, and a heated U.S. EPA Method 5-type glass-fiber filter (40 CFR Part 60, Appendix A) for collection of particulate matter. The filter shall be followed by an in-line flow-through cartridge containing 20 grams of XAD-2 sorbent resin for collecting semivolatile hydrocarbons. Water vapor shall then be removed from the sampled gas by a silica-gel trap. Flue-gas oxygen concentrations, which shall be used to determine the ratio of flue-gas volume to the amount of fuel burned, are measured within the ESS system by an elec-

trochemical cell meeting the performance specifications presented in Section 31.202.3.8(1).

The ESS shall use a critical orifice to maintain a nominal flue-gas sampling rate of 0.035 cfm (0.0167 liters per second). The actual flow rate through each critical orifice shall be determined to within 0.000354 cubic feet (0.01 liters) per second before and after each test-burn with a bubble flow meter to document exact sampling rates. The posttest-burn critical-orifice flow-rate determinations shall be performed before the ESS is dismantled for sample recovery and clean-up. Pretest-burn and posttest-burn critical-orifice flow-rate measurements shall be within 0.0000117 cubic feet (0.00033 liters) per second of each other or the test-burn emissions results shall be invalid. Temperatures shall be monitored using type K ground-isolated, stainless steel-sheathed thermocouples.

The ESS unit shall return particle-free and dry exhaust gas to the flue via a 1/4-inch (6 mm) Teflon® line and a 15-inch (380 mm) stainless steel probe inserted into the flue. A subsample aliquot of the flue-gas sample-gas stream exiting the ESS unit, shall be pumped into a 1 cubic foot (29 liter) Tedlar® bag for measuring the average carbon dioxide, carbon monoxide, and confirmation of average oxygen concentrations for the test period. Flow to the subsample gas bag shall be controlled by a solenoid valve connected to the main pump circuit and a fine-adjust needle-controlled flow valve. The solenoid valve shall be open only when the pump is activated, allowing the subsample gas to be pumped into the gas bag at all times when the ESS pump is on. The rate of flow into the bag shall be controlled by the fine-adjust metering needle-valve which is adjusted at setup so that 4.7 to 5.2 gal (18 to 20 liters) of gas is collected over the entire 3 test-fuel charge test-burn without over-pressurizing the gas sample bag.

**31.203.12.2 The data acquisition and control system.** The data acquisition and control system for the ESS is shown in Figure 31-2-2. This system consists of a personal computer (PC) containing an analog-to-digital data processing board (12-bit precision), a terminal (connection) box, and specialized data acquisition and system control software (called CONLOG). For fireplace testing, the CONLOG software is configured to control, collect, and store the following data:

1. Test-period starting and ending times and dates, and total length of sampling period;
2. Pump-cycle on/off, cycle length and thermocouple (TC) cycle recording interval (frequency);
3. Temperature records, including flue-gas and ambient temperatures, averaged over preselected intervals;
4. Date, times, and weights of each added fuel load; and
5. Flue-gas oxygen measurements taken during each sample cycle.

During testing, instantaneous readings of real-time data shall be displayed on the system status screen. These data shall include the date, time, temperatures for each of the TCs, and flue-gas oxygen concentrations. The most recent 15 sets of recorded data shall also be displayed.

Flue-gas sampling and the recording of flue-gas oxygen concentrations shall only occur when flue-gas temperatures are above 25°F (14°C) greater than the ambient temperature of the test facility. Temperatures and fueling shall always be

recorded at five-minute intervals regardless of flue-gas temperature. The ESS sampling-pump operating cycle shall be adjustable as described in Section 31.203.12.3.

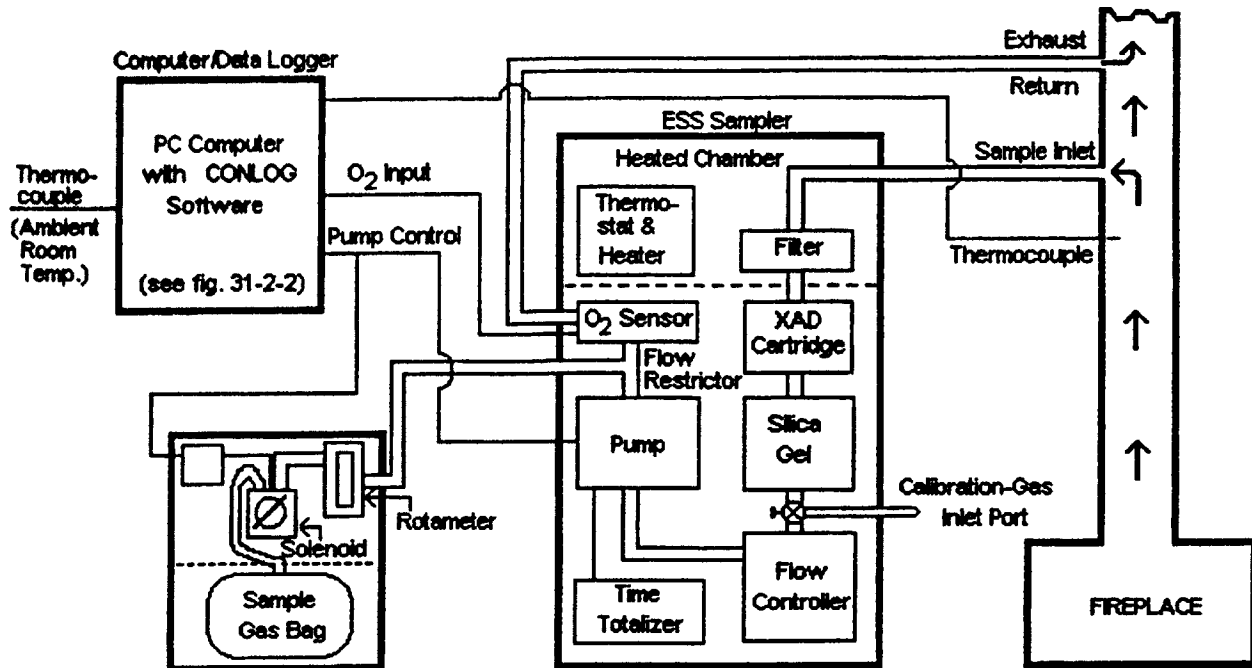


Figure 31-2-1. Schematic of ESS/Data Logger system.

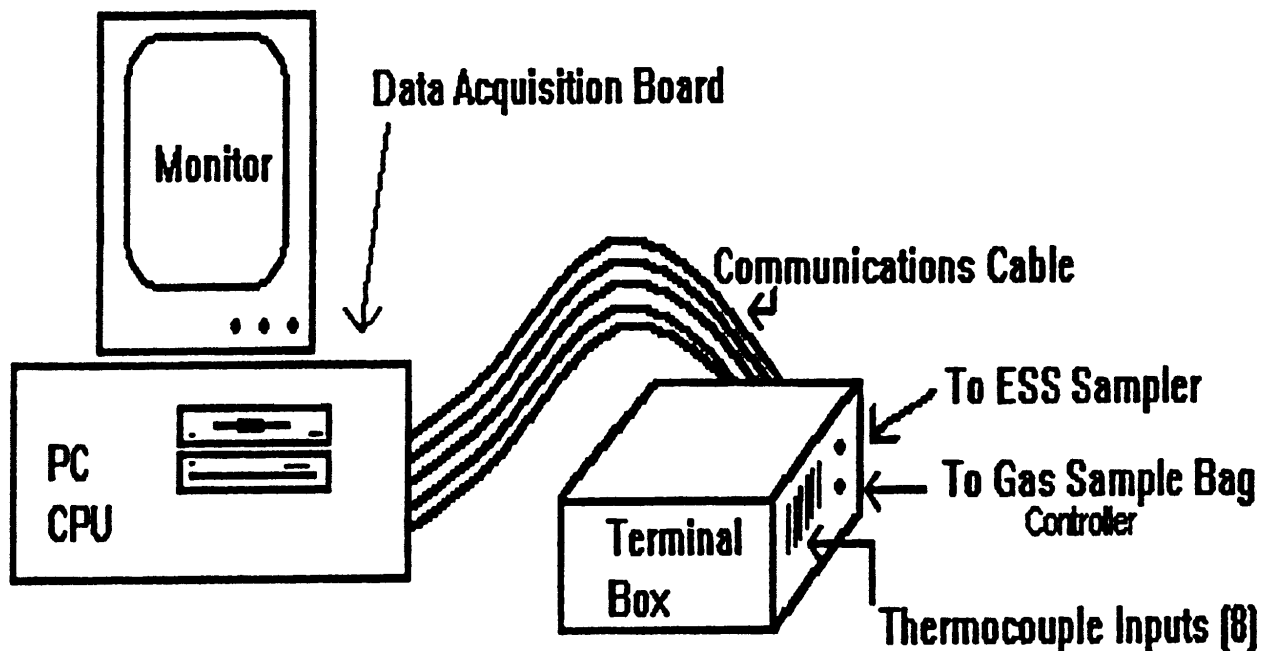


Figure 31-2-2. ESS data logger system.

**31.203.12.3 ESS sampling-pump operating cycle.** The ESS sampling-pump operating cycle shall be adjusted to accommodate variable test-fuel charge sizes, emission factors, and the length of time needed to complete a test-burn series. The sampler-pump operation shall be adjustable from 1 second to 5 minutes (100 percent) "on" for every 5-minute test-burn data-recording interval. This will allow adjustment for the amount of anticipated emissions materials that will be

sampled and deposited on the ESS filter, XAD-2, and the other system components. It is recommended that the minimum sample quantities stipulated in Section 31.203.12.4 be used to calculate the appropriate pump cycle "on" and "off" periods. It should be noted that if the sampler collects too much particulate material on the filter and in the XAD-2 cartridge, the unit may fail the sample flow calibration check required at the end of each test-burn.

**31.203.12.4 Minimum sample quantities.** For each complete 3 test-fuel charge test-burn, the ESS must catch a minimum total particulate material mass of at least 0.231 grains (15 mg). Alternatively, the ESS must sample a minimum of 10 cubic feet (283 liters) during each 3 test-fuel charge test-burn. If this volume cannot be sampled in the test-burn time period, two ESS samplers must be utilized to sample fire-place emissions simultaneously during each test-burn. If emissions results from the two ESSs are different by more than 10 percent of the lower emissions-factor result, the test-burn results are invalid. An arithmetic average is calculated for test-burn results when two ESSs are utilized.

**31.203.12.5 Equipment preparation and sample processing procedures.**

**31.203.12.5.1.** Prior to emissions testing, the ESS unit shall be prepared with a new, tared glass-fiber filter and a clean XAD-2 sorbent-resin cartridge. Within 3 hours after testing is completed, the stainless steel sampling probe, Teflon® sampling line, filter holder, and XAD-2 cartridge(s) shall be removed from the test site and transported to the laboratory for processing. Each component of the ESS sampler shall be processed as follows:

1. Filter: The glass fiber filter (4 inches (102 mm) in diameter) shall be removed from the ESS filter housing and placed in a petri dish for desiccation and gravimetric analysis.

2. XAD-2 sorbent-resin cartridge: The sorbent-resin cartridge shall be extracted in a Soxhlet extractor with dichloromethane for 24 hours. The extraction solution shall be transferred to a tared glass beaker and evaporated in an ambient-air dryer. The beaker with dried residue shall then be desiccated to constant weight (less than  $\pm 0.5$  mg change within a 2-hour period), and the extractable residue shall be weighed.

3. ESS hardware: All hardware components which are in the flue-gas sample stream (stainless steel probe, Teflon® sampling line, stainless steel filter housing, and all other Teflon® and stainless steel fittings) through the top of the sorbent-resin cartridge, shall be cleaned with a solvent mixture of 50 percent dichloromethane and 50 percent methanol. The cleaning solvent solutions shall be placed in tared glass beakers, evaporated in an ambient-air dryer, desiccated to constant weight (less than  $\pm 0.5$  mg change within a 2-hour period), and weighed.

EPA Method 5H procedures (40 CFR Part 60, Appendix A) for desiccation and weighing time intervals shall be followed for steps 1 through 3 above.

$$\text{Particulate emission factor (g/kg)} = \frac{(\text{Particulate Catch}) \times (\text{Stoichiometric Volume}) \times (\text{Flue-gas Dilution Factor})}{(\text{Sampling Time}) \times (\text{Sampling Rate})}$$

**WHERE:**

1. Particulate Catch: The total mass, in grams, of particulate material caught on the filter, in the XAD-2 resin cartridge (semivolatile compounds); and in the probe clean-up and rinse solutions.

2. Stoichiometric Volume: Stoichiometric volume is the volume of dry air needed to completely combust one dry kilogram of fuel with no "excess air." This value is determined by using a chemical reaction balance between the specific fuel being used and the chemical components of air. The stoichiometric volume for Douglas fir is 86.78 cubic feet per pound

**31.203.12.5.2** The ESS shall be serviced both at the start and end of a fireplace testing period. During installation, leak checks shall be performed; the thermocouples, fuel-weighing scale, and oxygen-cell shall be calibrated, and the data logger shall be programmed. At the end of the test period, final calibration, and leak-check procedures shall again be performed, and the ESS sampling line, filter housing, XAD-2 cartridge, sampling probe, and Tedlar® bag shall be removed, sealed, and transported to the laboratory for analysis. If the pretest and posttest leak checks of the ESS system exceed 0.00033 liters per second, the test-burn emission results shall be invalid.

**31.203.12.6 Data processing and quality assurance.**

**31.203.12.6.1** Upon returning to the laboratory facilities, the data file (computer disk) shall be reviewed to check for proper equipment operation. The data-logger data files, log books, and records maintained by field staff shall be reviewed to ensure sample integrity.

The computer-logged data file shall be used in conjunction with the ESS particulate samples and sample-gas bag analyses to calculate the emission factor, emission rate, and fireplace operational parameters. An example ESS results report is presented in Table 31-2-A.

**31.203.12.6.2 Burning period.** The total burning period is calculated by:

$$\text{Total Burning Period} = (\text{Length of each sample cycle}) \times (\text{Number of flue temperature readings over } 25^{\circ}\text{F (}14^{\circ}\text{C) greater than the ambient temperature of the test facility}).$$

**WHERE:**

1. Length of each sample cycle: The time between each temperature recording as configured in the CONLOG software settings (standardized at 5 minutes).

2. Number of flue temperature readings during fireplace use: The total number of temperature readings when the calibrated temperature value was more than 25°F (14°C) greater than the ambient temperature of the test facility.

**31.203.12.6.3 Particulate emissions.**

**31.203.12.6.3.1 ESS particulate emission factor.** The equation for the total ESS particulate emission factor for each test-burn presented below produces reporting units of grams per dry kilogram of fuel burned (g/kg):

(5 404 liters per dry kilogram) at 68°F (20°C) and 29.92 inches (760 mm) of mercury pressure.

3. Flue-gas Dilution Factor: The degree to which the sampled combustion gases have been diluted in the flue by air in excess of the stoichiometric volume (called excess air). The dilution factor is obtained by using the average sampled carbon dioxide and carbon monoxide values obtained from the sample gas bag analyses and the following equation:

Flue-Gas Dilution Factor =

$$18.53 + \left( \frac{\phi}{\lambda} - \frac{\phi}{\lambda} \frac{\text{CO}_2 + \frac{1}{2} \text{CO}}{18.53} \frac{\kappa}{\mu} \kappa \times 2.37 \right) (\text{CO}_2 + \frac{1}{2} \text{CO})$$

Note: Multiplying the g/kg emission factor by the burn rate (dry kg/hr) yields particulate emissions in grams per hour (g/hr). Burn rate is calculated by the following equation:

$$\text{Burn Rate (kg/hr)} = \frac{\text{Total Fuel (kg)}}{\text{Total Burn Period (hours)}}$$

**WHERE:**

Total Fuel is the total fuel added during the entire test-burn minus the remaining unburned materials at the end of the test-burn.

4. Sampling Time: The number of minutes the sampler pump operated during the total test-burn period.

$$\text{CO emission factor (g/kg)} = \frac{(\text{Fraction CO}) \times (\text{Stoichiometric Volume}) \times (\text{Dilution Factor}) \times (\text{Molecular Weight of CO})}{(24.45 \text{ L/mole})}$$

**WHERE:**

1. Fraction CO: The fraction of CO measured in the gas sampling bag.

Note: Percent CO divided by 100 gives the fraction CO.

2. Molecular Weight of CO: The gram molecular weight of CO, 28 pounds per pound-mole (28.0 g/g-mole).

Multiplying the results of the above equation by the burn rate (dry kg/hr) yields the grams per hour (g/hr) CO emission rate.

**Table 31-2-A Example ESS Data Results Format**  
**ESS Emission Results**

Test Facility Location:	xxxx
Test Laboratory:	xxxx
Test-Burn Number:	xxxx
Start Time/Date:	xxxx
End Time/Date:	xxxx
Fireplace Model:	xxxx
<b>TIME</b>	
Total Test Period	152.3 hours
Total Burn Time	64.6 hours
Flue > 25 Degrees F above ambient temperature	42.4 %
<b>ESS SETTINGS</b>	
ESS Sample Rate	1.004 l/min
Sample Cycle	5.0 min
Sample Time/Sample Cycle	0.443 min
<b>TEST FUEL</b>	
Total Fuel Used (wet weight)	101.3 kg
Ave. Fuel Moisture (dry basis)	17.7 %
Total Fuel Used (dry weight)	86.1 kg
Average Test-Fuel Charge	14.5 kg

5. Sampling Rate: Sampling rate is controlled by the critical orifice installed in the sampler. The actual calibrated sampling rate is used here.

**31.203.12.6.3.2 EPA Method 5H particulate emissions.** ESS-measured emissions factors submitted to DOE for approval must first be converted to U.S. EPA Method 5H equivalents. The ESS particulate emissions factor results obtained in Section 31.203.12.6.1 are converted to be equivalent to the U.S. EPA Method 5H emissions factor results by the following equation:

$$1.254 + (0.302 \times \text{PEF}) + (1.261 \times 10^{-\text{PEF}})$$

**WHERE:**

PEF is the ESS-measured particulate emission factor for a test-burn.

**31.203.12.6.4 CO emissions.** The carbon monoxide (CO) emission factor equation produces grams of CO per dry kilogram of fuel burned. The grams per kilogram equation includes some equation components described above.

**TEST FUEL**

Average Burn Rate 1.33 dry kg/hr

**PARTICULATE EMISSIONS (EPA METHOD 5H EQUIVALENTS)**

Gram/Kilogram	2.6 g/kg
Gram/Hour	3.4 g/hr
Gram/Cubic Meter	0.06 g/m <sup>3</sup>

**CARBON MONOXIDE EMISSIONS**

Gram/Kilogram	48.0 g/kg
Gram/Hour	64.0 g/hr
Gram/Cubic Meter	1.25 g/m <sup>3</sup>

**AVERAGE TEMPERATURES**

Fuel-Gas Temper- atures	135°C	275°F
Flue Exit Temper- ature	154°C	308°F
Test Facility Ambient Temper- ature	19°C	66°F

**AVERAGE FLUE-GAS CONCENTRATIONS**

Flue Oxygen (SE)	18.15 %
Flue Oxygen (gas bag or analyzer)	18.05 %
Flue CO (gas bag or analyzer)	0.10 %
Flue CO <sub>2</sub> (gas bag or analyzer)	2.60 %

**BREAKDOWN OF ESS PARTICULATE SAMPLE**

Rinse	25.5 mg
XAD	6.3 mg
Filter	15.7 mg
Blank	0.0 mg
<b>TOTAL</b>	<b>47.4 mg</b>

Notes: NM = Not Measured, NA = Not Applicable, NU = Not Used  
Total time flue temperature greater than 25°F over ambient temperature.

TEST PERFORMED BY: XYZ Testing International, Olympia, Washington, 98504.

### 31.203.13 Calibrations.

**31.203.13.1 Balance.** Before each certification test, the balance used for weighing test-fuel charges shall be audited by weighing at least one calibration weight (Class F) that corresponds to 20 percent to 80 percent of the expected test-fuel charge weight. If the scale cannot reproduce the value of the calibration weight within 0.1 lb (0.05 kg) or 1 percent of the expected test-fuel charge weight, whichever is greater, recalibrate the scale before use with at least five calibration weights spanning the operational range of the scale.

**31.203.13.2 Temperature monitor.** Calibrate the Temperature Monitor before the first certification test and semiannually thereafter.

**31.203.13.3 Fuel moisture meter.** Calibrate the Fuel Moisture Meter as per the manufacturer's instructions before each certification test.

**31.203.13.4 Anemometer.** Calibrate the anemometer as specified by the manufacturer's instructions before the first certification test and semiannually thereafter.

**31.203.13.5 Barometer.** Calibrate the barometer against a mercury barometer before the first certification test and semiannually thereafter.

**31.203.13.6 Draft gauge.** Calibrate the draft gauge as per the manufacturer's instructions; a liquid manometer does not require calibration.

**31.203.13.7 ESS.** The ESS shall be calibrated as specified in Section 31.203.12.1.

**31.203.14 Reporting criteria.** Submit both raw and reduced data for all fireplace tests. Specific reporting requirements are as follows:

**31.203.14.1 Fireplace identification.** Report fireplace identification information including manufacturer, model, and serial number. Include a copy of fireplace installation and operation manuals.

**31.203.14.2 Test facility information.** Report test facility location, temperature, and air velocity information.

**31.203.14.3 Test equipment calibration and audit information.** Report calibration and audit results for the test-fuel balance, test-fuel moisture meter, analytical balance, and sampling equipment including volume metering systems and gaseous analyzers.

**31.203.14.4 Pretest information and conditions.** Report all pretest conditions including test-fuel charge weight, fireplace temperatures, and air supply settings.

**31.203.14.5 Particulate emission data.** Report a summary of test results for all test-burns conducted and the arithmetically averaged emission factor for all test-burns used for certification. Submit copies of all data sheets and other records

collected during the testing. Submit examples of all calculations.

**31.203.14.6 Required test report information and suggested format.** Test report information requirements to be provided to DOE for approval/certification of fireplaces are presented in this standard. The requirements are presented here in a recommended report format.

#### 31.203.14.6.1 Introduction.

1. Purpose of test: Certification or audit.
2. Fireplace identification: Manufacturer, model number, catalytic/noncatalytic, and options. Include a copy of fireplace installation and operation manuals.
3. Laboratory: Name, location, and participants.
4. Test information: Date fireplace was received, date of tests, sampling methods used, and number of test-burns.

#### 31.203.14.6.2 Summary and discussion of results.

1. Table of results: Test-burn number, burn rate, particulate emission factor (in U.S. EPA Method 5H equivalents), efficiency (if determined), and averages (indicate which test-burns are used).
2. Summary of other data: Test facility conditions, surface temperature averages, catalyst temperature averages, test-fuel charge weights, and test-burn times.
3. Discussion: Specific test-burn problems and solutions.

#### 31.203.14.6.3 Process description.

1. Fireplace dimensions: Volume, height, width, lengths (or other linear dimensions), weight, and hearth area.
2. Firebox configuration: Air supply locations and operation, air supply introduction location, refractory location and dimensions, catalyst location, baffle and by-pass location and operation (include line drawings and photographs).
3. Process operation during test: Air supply settings and adjustments, fuel bed adjustments, and draft.
4. Test fuel: Test fuel properties (moisture and temperature), test fuel description (include line drawings or photograph), and test fuel charge density.

**31.203.14.6.4 Sampling locations.** Describe sampling location relative to fireplace. Include line drawings and photographs.

#### 31.203.14.6.5 Sampling and analytical procedures.

1. Sampling methods: Brief reference to operational and sampling procedures, and optional and alternative procedures used.
2. Analytical methods: Brief description of sample recovery and analysis procedures.

#### 31.203.14.6.6 Quality control and assurance procedures and results.

1. Calibration procedures and results: Certification, sampling, and analysis procedures.
2. Test method quality control procedures: Leak-checks, volume-meter checks, stratification (velocity) checks, and proportionality results.

#### 31.203.14.6.7 Appendices.

1. Results and Example Calculations. Include complete summary tables and accompanying examples of all calculations.

2. Raw Data. Include copies of all uncorrected data sheets for sampling measurements, temperature records, and sample recovery data. Include copies of all burn rate and fireplace temperature data.

3. Sampling and Analytical Procedures. Include detailed description of procedures followed by laboratory personnel in conducting the certification test, emphasizing particularly, parts of the procedures differing from the prescribed methods (e.g., DOE approved alternatives).

4. Calibration Results. Summary of all calibrations, checks, and audits pertinent to certification test results including dates.

5. Participants. Test personnel, manufacturer representatives, and regulatory observers.

6. Sampling and Operation Records. Copies of uncorrected records of activities not included on raw data sheets (e.g., fireplace door open times and durations).

7. Additional Information. Fireplace manufacturer's written instructions for operation during the certification test and copies of the production-ready (print-ready) temporary and permanent labels required in Section 31.208 shall be included in the test report prepared by the test laboratory.

#### **31.203.14.7 References.**

1. Code of Federal Regulations, U.S. EPA Title 40, Part 60, Subpart AAA and Appendix A (40 CFR Part 60).

2. Barnett, S. G. and P. G. Fields, 1991, In-Home Performance of Exempt Pellet Stoves in Medford, Oregon, prepared for U.S. Department of Energy, Oregon Department of Energy, Tennessee Valley Authority, and Oregon Department of Environmental Quality, July 1991.

3. Barnett, S. G. and R. R. Roholt, 1990, In-Home Performance of Certified Pellet Stoves in Medford and Klamath Falls, Oregon, prepared for the U.S. Department of Energy, 1990.

4. Barnett, S. G., 1990, "Field Performance of Advanced Technology Woodstoves in Glens Falls, New York, 1988-1989," for New York State Energy Research and Development Authority, U.S. EPA, Coalition of Northeastern Governors, Canadian Combustion Research Laboratory, and the Wood Heating Alliance, December 1989.

#### **SECTION 31.204—APPROVAL PROCEDURE FOR FIREPLACES.**

On or after the effective date of this regulation, a manufacturer or builder of a fireplace who wishes to have a fireplace model line or fireplace design designated as an approved (or certified) fireplace, shall submit to DOE for its review the following information:

**31.204.1** Manufacturer name and street address, model or design identification, construction specifications, and drawings of the firebox and required chimney system.

**31.204.2** A test report prepared in accordance with Section 31.203.14.6 showing that testing has been conducted by a DOE approved and U.S. EPA accredited laboratory, and that the arithmetically averaged particulate emission factors for that fireplace model line or design, tested in accordance with Washington State Building Code Standard 31-2, Section

31.202, does not exceed 7.3 g/kg (U.S. EPA Method 5H equivalent as determined in Section 31.203.12.6.3.2) for factory-built fireplace model lines or designs or 12.0 g/kg (U.S. EPA Method 5H equivalent as determined in Section 31.203.12.6.3.2) for new certified masonry fireplace model lines or designs. After January 1, 1999, particulate emission factors for factory-built and new certified masonry fireplace model lines or designs shall not exceed 7.3 g/kg (U.S. EPA Method 5H equivalents as determined in Section 31.203.12.6.3.2).

#### **SECTION 31.205—APPROVAL OF NONTESTED FIREPLACES.**

On or after the effective date of this regulation, DOE may grant approval for a fireplace model line or design that has not been tested pursuant to Section 31.204 upon submission of the following by the applicant:

**31.205.1** Manufacturer name and street address, model or design identification, construction specifications, and drawings of the internal assembly system.

**31.205.2** Documentation from an EPA accredited laboratory that the model is a fireplace within the definition of this regulation, has substantially the same core construction as a model already tested by a DOE approved and EPA accredited laboratory, and is substantially similar to the approved model in internal assembly design, combustion function, and probable emissions performance as listed in Section 31.204.2.

#### **SECTION 31.206—APPROVAL THROUGH ALTERNATIVE TEST PROTOCOL.**

As provided in Section 31.202.4, an alternative testing protocol may be submitted by a DOE approved and EPA accredited laboratory for acceptance by DOE as equivalent to Washington State Building Code Standard 31-2.

#### **SECTION 31.207—APPROVAL TERMINATION.**

All fireplace model line or design approvals shall terminate five years from the approval date. Previously approved fireplace model line and/or design may be granted reapproval (recertification) upon application to and review by DOE. No testing shall be required for fireplace model line or design reapprovals unless DOE determines that design changes have been incorporated into the fireplace that could adversely affect the emissions factor, or testing is otherwise stipulated by DOE.

DOE may revoke a fireplace model line or design approval certification if it is determined that the fireplaces being produced in a specific model line do not comply with the requirements of Section 31.200. Such a determination shall be based on all available evidence, including:

1. Test data from a retesting (audit test) of the original unit on which the certification test was conducted or a sample unit from the current model line;

2. A finding that the certification test was not valid;

3. A finding that the labeling of the fireplace does not comply with the requirements of Section 31.200;

4. Failure by the fireplace manufacturer (builder) to comply with reporting and recordkeeping requirements under Section 31.200;



5. Physical examination showing that a significant percentage of production units inspected are not similar in all material respects to the fireplace submitted for testing; or

6. Failure of the manufacturer to conduct a quality assurance program in conformity with Section 31.208.

Revocation of certification under this section shall not take effect until the manufacturer (builder) concerned has been given written notice by DOE setting forth the basis for the proposed determination and an opportunity to request a hearing.

#### SECTION 31.208—QUALITY CONTROL.

Once within 30 days of each annual anniversary after the initial approval/certification, a DOE approved and U.S. EPA accredited laboratory shall inspect the most recently produced fireplace of an approved model line or design at its manufacturing location (site, if site-built) to document adherence to the approved/certified fireplace design specifications. If no fireplaces of an approved model line or design were produced (built) during the previous 12 months, no inspection is required.

An inspection report for each approved fireplace model line or design must be submitted to DOE within 30 days after the inspection date. The inspection report shall include, as a minimum, the model identification and serial number of the fireplace inspected, the location where the model was inspected, the names of the manufacturer's and/or builder's representatives present, the date of inspection, and a description of any changes made to the approved fireplace model line or design since the last inspection. The U.S. EPA accredited laboratory which conducts the annual quality control inspection is responsible for auditing the content and format of all labels to be applied to approved fireplaces as stipulated in 31.209.

A fireplace model line or design shall be retested in accordance with Section 31.202 if it is determined during inspection that design changes have been incorporated into the approved/certified fireplace design which adversely affect the fireplace particulate emissions factor. Design elements which can affect fireplace particulate emissions include:

1. Grate placement and height;
2. Air supply minimum and maximum controls;
3. Usable hearth area; and
4. Firebox height, width, and length dimensions.

#### SECTION 31.209 —PERMANENT LABEL, TEMPORARY LABEL AND OWNER'S MANUAL.

**31.209.1 Labels and the owner's manual.** Labels and owner's manual shall be prepared and installed in all certified "FOR SALE" fireplaces as specified in U.S. EPA 40 CFR Part 60, Section 60.536. Information that shall be presented on all labels includes:

1. Manufacturer's or builder's name, address, and phone number;
2. Model number and/or name;
3. Month and year of manufacture;
4. Starting and ending dates for the 5-year approval period;
5. If a fireplace was tested and approved with an emissions control device which is not an integral part of the fire-

place structure, the label shall state that "The fireplace cannot be sold or installed without the specified emissions control device in place and operational";

6. On certified fireplaces the statement: "This appliance has been tested and has demonstrated compliance with Washington state amendment to the Washington State Building Code Standard 31-2 requirements."

#### SECTION 31.210—LIST OF APPROVED FIREPLACES.

DOE shall maintain a list of approved fireplace model lines and designs, and that list shall be available to the public.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-31200, filed 12/17/03, effective 7/1/04.]

#### WAC 51-50-3408 Section 3408—Moved structures.

**3408.1 Conformance.** Buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code, the International Residential Code (chapter 51-51 WAC), the International Mechanical Code (chapter 51-52 WAC), the International Fire Code (chapter 51-54 WAC), the Uniform Plumbing Code and Standards (chapters 51-56 and 51-57 WAC), the Washington State Energy Code (chapter 51-11 WAC) and the Washington State Ventilation and Indoor Air Quality Code (chapter 51-13 WAC) for new buildings or structures.

**EXCEPTION:** Group R-3 buildings or structures are not required to comply if:

1. The original occupancy classification is not changed; and
2. The original building is not substantially remodeled or rehabilitated.

For the purposes of this section, a building shall be considered to be substantially remodeled when the costs of remodeling exceed 60 percent of the value of the building exclusive of the costs relating to preparation, construction, demolition or renovation of foundations.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-3408, filed 12/17/03, effective 7/1/04.]

#### WAC 51-50-3409 Section 3409—Accessibility for existing buildings.

**3409.7 Alterations affecting an area containing a primary function.** Where an alteration affects the accessibility to, or contains an area of primary function, the route to the primary function area shall be accessible. The accessible route to the primary function area shall include toilet facilities, telephones or drinking fountains serving the area of primary function.

**EXCEPTIONS:**

1. The costs of providing the accessible route are not required to exceed 20 percent of the costs of the alteration affecting the area of primary function.
2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to alterations undertaken for the primary purpose of increasing the accessibility of an existing building, facility or element.

**3409.8.9 Toilet rooms.** Where it is technically infeasible to alter existing toilet and bathing facilities to be accessible, an

accessible unisex toilet or bathing facility is permitted. The unisex facility shall be located on the same floor and in the same area as the existing facility. The number of toilet facilities and water closets required by the State Building Code is permitted to be reduced by one, in order to provide accessible features.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-3409, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-3409, filed 12/17/03, effective 7/1/04.]

## WAC 51-50-480000 Appendix Chapter M.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480000, filed 12/19/06, effective 7/1/07.]

## INTERNATIONAL EXISTING BUILDING CODE 2006 EDITION

### WAC 51-50-480101 Section 101—General.

**101.4 Applicability.** When requested by the permit applicant, this code shall apply to the repair, alteration, change of occupancy and relocation of buildings existing on the date of adoption of this code, regardless of occupancy, subject to the criteria of Sections 101.4.1 and 101.4.2. When compliance with this code has not been requested, compliance with the International Building, Fire and Mechanical Codes (as applicable) shall be demonstrated.

**101.4.2 Buildings previously occupied.** The legal occupancy of any building existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the International Fire Code, or the International Property Maintenance Code, or as deemed necessary by the code official to mitigate an unsafe building. For the purpose of this section, "unsafe building" is not to be construed as mere lack of compliance with the current code.

**101.5 Compliance methods.** The repair, alteration, change of occupancy, addition or relocation of all existing buildings shall comply with one of the methods listed in Sections 101.5.1 through 101.5.3 as selected by the applicant. Application of a method shall be the sole basis for assessing the compliance of work performed under a single permit unless otherwise approved by the code official. Sections 101.5.1 through 101.5.3 shall not be applied in combination with each other.

**EXCEPTION:** Subject to the approval of the code official, alterations complying with the laws in existence at the time the building or the affected portion of the building was built shall be considered in compliance with the provisions of this code unless the building is undergoing more than a limited structural alteration as defined in Section 807.5.3. New structural members added as part of the alteration shall comply with the International Building Code. Alterations of existing buildings in flood hazard areas shall comply with Section 601.3.

**101.7 Appendices.** The code official is authorized to require rehabilitation and retrofit of buildings, structures, or individual structural members in accordance with the appendices of this code if such appendices have been individually adopted. Where Appendix A, Guidelines for the Seismic Retrofit of

Existing Buildings, is specifically referenced in the text of this code, it becomes part of this code without any specific adoption by the local jurisdiction.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480101, filed 12/19/06, effective 7/1/07.]

### WAC 51-50-480102 Section 102—Applicability.

**102.4.1 Fire prevention.** The provisions of the International Fire Code shall apply to matters affecting or relating to structures, processes and premises from the hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; from conditions hazardous to life, property or public welfare in the occupancy of structures or premises; and from the construction, extension, repair, alteration or removal of fire suppression and alarm systems or fire hazards in the structure or on the premises from occupancy or operation except as specifically provided for in this code.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480102, filed 12/19/06, effective 7/1/07.]

### WAC 51-50-480302 Section 302—Additions, alterations or repairs.

**302.1 Existing buildings or structures.** Additions or alterations to any building or structure shall comply with the requirements of the *International Building Code* for new construction except as specifically provided in this code. Additions or alterations shall not be made to an existing building or structure that will cause the existing building or structure to be in violation of any provisions of the *International Building Code*. An existing building plus additions shall comply with the height and area provisions of the *International Building Code*. Portions of the structure not altered and not affected by the alteration are not required to comply with the code requirements for a new structure.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480302, filed 12/19/06, effective 7/1/07.]

### WAC 51-50-480305 Section 305—Change of occupancy.

**[B] 305.1 Conformance.** No change shall be made in the use or occupancy of any building that would place the building in a different division of the same group of occupancy or in a different group of occupancies, unless such building is made to comply with the requirements of the *International Building Code* for such division or group of occupancy. Subject to the approval of the building official, the use or occupancy of existing buildings shall be permitted to be changed and the building is allowed to be occupied for purposes in other groups without conforming to all the requirements of the *International Building Code* for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use. The hazard tables of Chapter 9 may be used to demonstrate the relative fire and life risk of the existing and the new proposed uses.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480305, filed 12/19/06, effective 7/1/07.]

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

### WAC 51-50-480405 Section 405—Alteration—Level 3.

**405.1 Scope.** Level 3 alterations apply where the work area exceeds 50% of the floor area of the building.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480405, filed 12/19/06, effective 7/1/07.]

### WAC 51-50-480506 Section 506—Structural.

**506.1.1.2 IBC level seismic forces.** When seismic forces are required to meet the *International Building Code* level, they shall be one of the following:

1. One hundred percent of the values in the *International Building Code*. The *R*-factor used for analysis in accordance with Chapter 16 of the *International Building Code* shall be the *R*-factor specified for structural systems classified as "ordinary" in accordance with Table 12.2-1 of ASCE 7, unless it can be demonstrated that the structural system satisfies the proportioning and detailing requirements for systems classified as "intermediate" or "special."

2. Those associated with the BSE-1 and BSE-2 Earthquake Hazard Levels defined in ASCE 41. Where ASCE 41 is used, the corresponding performance levels shall be those shown in Table 506.1.1.2.

**TABLE 506.1.1.2  
ASCE 41 AND ASCE 31 PERFORMANCE LEVELS**

OCCUPANCY CATEGORY (BASED ON IBC TABLE 1604.5)	PERFORMANCE LEVEL FOR USE WITH ASCE 31 AND WITH ASCE 41 BSE-1 EARTHQUAKE HAZARD LEVEL	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-2 EARTHQUAKE HAZARD LEVEL
I	Life Safety (LS)	Collapse Prevention (CP)
II	Life Safety (LS)	Collapse Prevention (CP)
III	Note a	Note a
IV	Immediate Occupancy (IO)	Life Safety (LS)

- a. Performance levels for Occupancy Category III shall be taken as halfway between the performance levels specified for Occupancy Category II and IV. Where seismic forces are permitted to meet reduced *International Building Code* levels, the performance level for Occupancy Category III shall be Life Safety (LS). Where seismic forces are required to meet the *International Building Code* levels, performance levels for Occupancy Category III shall be taken as follows: Acceptance criteria shall be taken as twenty-five percent more restrictive than the acceptance criteria specified for Occupancy Category II performance levels, but need not be more restrictive than the acceptance criteria specified for Occupancy Category IV performance levels.

**506.1.1.3 Reduced IBC level seismic forces.** When seismic forces are permitted to meet reduced *International Building Code* levels, they shall be one of the following:

1. Seventy-five percent of the forces prescribed in the *International Building Code*. The *R*-factor used for analysis in accordance with Chapter 16 of the *International Building Code* shall be the *R*-factor as specified in Section 506.1.1.2 of this code.

2. In accordance with the applicable chapters in Appendix A of this code as specified in Items 2.1 through 2.5 below. Structures or portions of structures that comply with the

requirements of the applicable chapter in Appendix A shall be deemed to comply with the requirements for reduced *International Building Code* force levels.

2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.

2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A2.

2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A3.

2.4. Seismic evaluation and design of soft, weak or open-front wall conditions in multiunit residential buildings of wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A4.

2.5. Seismic evaluation and design of concrete buildings and concrete with masonry infill buildings in all occupancy categories are permitted to be based on the procedures specified in Appendix Chapter A5.

3. In accordance with ASCE 31 based on the applicable performance level as shown in Table 506.1.1.2.

4. Those associated with the BSE-1 Earthquake Hazard Level defined in ASCE 41 and the performance level as shown in Table 506.1.1.2. Where ASCE 41 is used, the design spectral response acceleration parameters  $S_{XS}$  and  $S_{XI}$  shall not be taken less than seventy-five percent of the respective design spectral response acceleration parameters  $S_{DS}$  and  $S_{DI}$  defined by the *International Building Code* and its reference standards.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480506, filed 12/19/06, effective 7/1/07.]

### WAC 51-50-480704 Section 704—Fire protection.

**704.1 Scope.** The requirements of this section shall be limited to work areas in which Level 2 alterations are being performed, and where specified they shall apply throughout the floor on which the work areas are located or otherwise beyond the work area.

**EXCEPTION:** For Level 2 alteration projects in which the fire protection requirements constitute an excessive burden, the fire protection requirements may be modified or waived by the fire code official.

**704.2 Automatic sprinkler systems.** Automatic sprinkler systems shall be provided in accordance with the requirements of Sections 704.2.1 through 704.2.5. Installation requirements shall be in accordance with the International Fire Code and NFPA 13 or NFPA 13R.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480704, filed 12/19/06, effective 7/1/07.]

**WAC 51-50-480807 Section 807—Structural.**

**807.5.1 Evaluation and analysis.** An engineering evaluation and analysis that establishes the structural adequacy of the altered structure shall be prepared by a registered design professional and submitted to the code official. For structures assigned to Seismic Design Category D, the registered design professional shall submit to the code official a seismic evaluation report of the existing building based on one of the procedures specified in Section 506.1.1.3. This seismic evaluation report shall not be required for buildings in compliance with the benchmark building provisions of ASCE 31, Section 3.2.

**807.5.2 Substantial structural alteration.** Any building or structure undergoing substantial improvement shall have an evaluation and analysis to demonstrate that the altered building or structure complies with the *International Building Code* for wind loading and with reduced *International Building Code* level seismic forces as specified in Section 507.1.1.3 for seismic loading. For seismic considerations, the analysis shall be based on one of the procedures specified in Section 507.1.1.1.

**807.5.3 Limited structural alteration.** Where any building or structure undergoes less than substantial improvement, the evaluation and analysis shall demonstrate that the altered building or structure complies with the loads applicable at the time the building was constructed.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480807, filed 12/19/06, effective 7/1/07.]

**WAC 51-50-480912 Section 912—Change of occupancy classification.**

**912.1.1 Compliance with Chapter 8.** The requirements of Chapter 8 shall be applicable throughout the building for the new occupancy classification based on the separation conditions set forth in Sections 912.1.1.1 and 912.1.1.2. All existing buildings with a change of occupancy classification shall comply with the seismic provisions of Section 907.3.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480912, filed 12/19/06, effective 7/1/07.]

**WAC 51-50-481101 Chapter 11—Historic buildings—Section 1101—General.**

**1101.1 Scope.** It is the intent of this chapter to provide means for the preservation of historic buildings as defined in Chapter 2. It is the purpose of this chapter to encourage cost-effective preservation of original or restored architectural elements and features and to provide a historic building that will result in a reasonable degree of safety, based on accepted life and fire safety practices, compared to the existing building. Historical buildings shall comply with the provisions of this chapter relating to their repair, alteration, relocation and change of occupancy.

**1101.2 Report.** A historic building undergoing repair, alteration, or change of occupancy shall be investigated and evaluated. If it is intended that the building meet the requirements of this chapter, a written report shall be prepared and filed

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with the code official by a registered design professional when such a report is necessary in the opinion of the code official. Such report shall be in accordance with Chapter 1 and shall identify each required safety feature that is in compliance with this chapter and where compliance with other chapters of these provisions would be damaging to the contributing historic features. In Seismic Design Category D or higher, a structural evaluation describing, at minimum, a complete load path and other earthquake-resistant features shall be prepared. In addition, the report shall describe each feature that is not in compliance with these provisions and shall demonstrate how the intent of these provisions is complied with in providing an equivalent level of safety.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481101, filed 12/19/06, effective 7/1/07.]

**WAC 51-50-481102 Section 1102—Repairs.**

**1102.4 Chapter 5 compliance.** Historic buildings undergoing repairs shall comply with all of the applicable requirements of Chapter 5, except as specifically permitted in this chapter.

**1102.5 Replacement.** Replacement of existing or missing features using original materials shall be permitted. Partial replacement for repairs that match the original in configuration, height, and size shall be permitted. Such replacements shall not be required to meet the materials and methods requirements of Section 501.2.

**EXCEPTION:** Replacement glazing in hazardous locations shall comply with the safety glazing requirements of Chapter 24 of the *International Building Code*.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481102, filed 12/19/06, effective 7/1/07.]

**WAC 51-50-481103 Section 1103—Fire safety.**

**1103.7 One-hour fire-resistant assemblies.** Where one-hour fire-resistance-rated construction is required by these provisions, it need not be provided, regardless of construction or occupancy, where the existing wall and ceiling finish is wood lath or metal lath and plaster.

**1103.9 Stairway railings.** Historically significant stairways shall be accepted without complying with the handrail and guard requirements. Existing handrails and guards at all stairs shall be permitted to remain, provided they are not structurally dangerous.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481103, filed 12/19/06, effective 7/1/07.]

**WAC 51-50-481104 Alterations.**

**1104.1 Accessibility requirements.** The provisions of Section 605 shall apply to buildings and facilities designated as historic structures that undergo alterations, unless technically infeasible. Where compliance with the requirements for accessible routes, ramps, entrances, or toilet facilities would threaten or destroy the historic significance of the building or facility, as determined by the professional responsible for the historical documentation of the project, the alternative

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requirements of Sections 1104.1.1 through 1104.1.4 for that element shall be permitted.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481104, filed 12/19/06, effective 7/1/07.]

### **WAC 51-50-481105 Section 1105—Change of occupancy.**

**1105.10 One-hour fire-resistant assemblies.** Where one-hour fire-resistance-rated construction is required by these provisions, it need not be provided, regardless of construction or occupancy, where the existing wall and ceiling finish is wood lath or metal lath and plaster.

**1105.14 Natural light.** When it is determined by the professional responsible for the historical documentation of the project that compliance with the natural light requirements of Section 911.1 will lead to loss of historic character or historic materials in the building, the existing level of natural lighting shall be considered acceptable.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481105, filed 12/19/06, effective 7/1/07.]

### **WAC 51-50-481500 Chapter 15—Referenced standards.**

<b>ASCE</b>	<b>American Society of Civil Engineers</b>
Standard	
Reference	
Number	Title
<b>41-06</b>	<b>Seismic Rehabilitation of Existing Buildings</b>
<b>NFPA</b>	<b>National Fire Protection Association</b>
Standard	
Reference	
Number	Title
<b>13-02</b>	<b>Installation of Sprinkler Systems</b>

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481500, filed 12/19/06, effective 7/1/07.]

### **Chapter 51-51 WAC**

#### **STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 2006 EDITION OF THE INTERNATIONAL RESIDENTIAL CODE**

#### **WAC**

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51-51-2000	Chapter 20—Boilers and water heaters.
51-51-4300	Chapter 43—Referenced standards.
51-51-60101	Appendix F radon control methods.
51-51-60103	Section AF103—Requirements.

#### **DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER**

51-51-0101	Section R101—Title, scope and purpose. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0101, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-090, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW.
51-51-0324	Section R324—Adult family homes. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0324, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-090, filed 12/19/06, effective 7/1/07. Statutory

### **WAC 51-50-481106 Section 1106—Structural.**

**1106.1 General.** Historic buildings shall comply with the applicable structural provisions for the work as classified in Chapter 5.

**EXCEPTION:** The code official shall be authorized to accept existing floors and approve operational controls that limit the live load on any such floor.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481106, filed 12/19/06, effective 7/1/07.]

### **WAC 51-50-481301 Chapter 13—Performance compliance methods.**

#### **Section 1301 General.**

**1301.4.1 Structural analysis.** The owner shall have a structural analysis of the existing building made to determine adequacy of structural systems for the proposed alteration, addition, or change of occupancy. The analysis shall demonstrate that the altered building or structure complies with the requirements of Chapter 16 of the *International Building Code*.

**EXCEPTION:** The reduced *International Building Code* level seismic forces as specified in Section 506.1.1.3 shall be permitted to be used for this analysis.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481301, filed 12/19/06, effective 7/1/07.]

- 51-51-2401 Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW.  
Section G2401 (101)—General. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-2401, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-090, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW.
- 51-51-2415 Section G2415 (404)—Piping system installation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-2415, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-090, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW.

**WAC 51-51-001 Authority.** These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-001, filed 12/17/03, effective 7/1/04.]

**WAC 51-51-002 Purpose.** The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-002, filed 12/17/03, effective 7/1/04.]

**WAC 51-51-003 International Residential Code.** The 2006 edition of the *International Residential Code* as published by the International Code Council is hereby adopted by reference with the following additions, deletions, and exceptions: Provided that chapters 11 and 25 through 42 of this code are not adopted. Energy Code is regulated by chapter 51-11 WAC; Plumbing Code is regulated by chapter 51-56 WAC; Electrical Code is regulated by chapter 296-46B WAC or Electrical Code as adopted by the local jurisdiction. Appendix G Swimming Pools, Spas and Hot Tubs is included in adoption of the International Residential Code.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-003, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-003, filed 12/17/03, effective 7/1/04.]

**WAC 51-51-007 Exceptions.** The exceptions and amendments to the International Residential Code contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

The provisions of this code do not apply to temporary growing structures used solely for the commercial production of horticultural plants including ornamental plants, flowers, vegetables, and fruits. "Temporary growing structure" means a structure that has the sides and roof covered with polyethylene, polyvinyl, or similar flexible synthetic material and is used to provide plants with either frost protection or increased heat retention. A temporary growing structure is not considered a building for purposes of this code.

The provisions of this code do not apply to the construction, alteration, or repair of temporary worker housing except as provided by rule adopted under chapter 70.114A RCW or chapter 37, Laws of 1998 (SB 6168). "Temporary worker

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housing" means a place, area, or piece of land where sleeping places or housing sites are provided by an employer for his or her employees or by another person, including a temporary worker housing operator, who is providing such accommodations for employees, for temporary, seasonal occupancy, and includes "labor camps" under RCW 70.54.110.

Codes referenced which are not adopted through RCW 19.27.031 or chapter 19.27A RCW shall not apply unless specifically adopted by the authority having jurisdiction.

The standards for liquefied petroleum gas installations shall be NFPA 58 (Liquefied Petroleum Gas Code) and NFPA 54 (National Fuel Gas Code). All other fuel gas installations shall be regulated by the International Mechanical Code and International Fuel Gas Code.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-007, filed 12/17/03, effective 7/1/04.]

**WAC 51-51-008 Implementation.** The International Residential Code adopted by chapter 51-51 Washington Administrative Code (WAC) shall become effective in all counties and cities of this state on July 1, 2007.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-008, filed 12/17/03, effective 7/1/04.]

## WAC 51-51-0102 Section R102—Applicability.

**R102.5 Appendices.** Provisions in the appendices shall not apply unless specifically referenced in the adopting ordinance. An appendix adopted by a local jurisdiction shall not be effective unless approved by the state building code council pursuant to RCW 19.27.060 (1)(a).

**R102.7.2 Moved buildings.** Buildings or structures moved into or within a jurisdiction shall comply with the provisions of this code, the International Building Code (chapter 51-50 WAC), the International Mechanical Code (chapter 51-52 WAC), the International Fire Code (chapter 51-54 WAC), the Uniform Plumbing Code and Standards (chapters 51-56 and 51-57 WAC), the Washington State Energy Code (chapter 51-11 WAC) and the Washington State Ventilation and Indoor Air Quality Code (chapter 51-13 WAC) for new buildings or structures.

**EXCEPTION:** Group R-3 buildings or structures are not required to comply if:

1. The original occupancy classification is not changed; and
2. The original building is not substantially remodeled or rehabilitated.

For the purposes of this section a building shall be considered to be substantially remodeled when the costs of remodeling exceed 60 percent of the value of the building exclusive of the costs relating to preparation, construction, demolition or renovation of foundations.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0102, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0102, filed 12/17/03, effective 7/1/04.]

**WAC 51-51-0202 Section R202—Definitions.**

**ADULT FAMILY HOME** means a dwelling in which a person or persons provide personal care, special care, room and board to more than one but not more than six adults who are not related by blood or marriage to the person or persons providing the services.

**CHILD DAY CARE**, shall, for the purposes of these regulations, mean the care of children during any period of a 24 hour day.

**CHILD DAY CARE HOME, FAMILY** is a child day care facility, licensed by the state, located in the dwelling of the person or persons under whose direct care and supervision the child is placed, for the care of twelve or fewer children, including children who reside at the home.

**DWELLING UNIT.** A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation. Dwelling units may also include the following uses:

1. Adult family homes, foster family care homes and family day care homes licensed by the Washington state department of social and health services.

2. Offices, mercantile, food preparation for off-site consumption, personal care salons or similar uses which are conducted primarily by the occupants of the dwelling unit and are secondary to the use of the unit for dwelling purposes, and which do not exceed 500 square feet (46.4m<sup>2</sup>).

**SMALL BUSINESS.** Any business entity (including a sole proprietorship, corporation, partnership or other legal entity) which is owned and operated independently from all other businesses, which has the purpose of making a profit, and which has fifty or fewer employees, or which has a million dollars or less per year in gross sales, of window products.

**UNUSUALLY TIGHT CONSTRUCTION.** Construction meeting the following requirements:

1. Walls exposed to the outside atmosphere having a continuous water vapor retarder with a rating of 1 perm (57 ng/s·m<sup>2</sup>·Pa) or less with openings gasketed or sealed;

2. Openable windows and doors meeting the air leakage requirements of the *International Energy Conservation Code*, Section 502.1.4; and

3. Caulking or sealants are applied to areas such as joints around window and door frames, between sole plates and floors, between wall-ceiling joints, between wall panels, at penetrations for plumbing, electrical and gas lines, and at other openings; or

4. Buildings built in compliance with the 1986 or later editions of the Washington State Energy Code chapter 51-11 WAC, Northwest Energy Code, or Super Good Cents weatherization standards or equivalent.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0202, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0202, filed 12/17/03, effective 7/1/04.]

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**WAC 51-51-0303 Section R303—Light, ventilation and heating.**

**R303.8.1 Definitions.** For the purposes of this section only, the following definitions apply.

**DESIGNATED AREAS** are those areas designated by a county to be an urban growth area in chapter 36.70A RCW and those areas designated by the U.S. Environmental Protection Agency as being in nonattainment for particulate matter.

**SUBSTANTIALLY REMODELED** means any alteration or restoration of a building exceeding 60 percent of the appraised value of such building within a 12 month period. For the purpose of this section, the appraised value is the estimated cost to replace the building and structure in kind, based on current replacement costs.

**R303.8.2 Primary Heating Source.** Primary heating sources in all new and substantially remodeled buildings in designated areas shall not be dependent upon wood stoves.

**R303.8.3 Solid Fuel Burning Devices.** No used solid fuel burning device shall be installed in new or existing buildings unless such device is United States Environmental Protection Agency certified or a pellet stove either certified or exempt from certification by the United States Environmental Protection Agency.

**EXCEPTION:** Antique wood cook stoves and heaters manufactured prior to 1940.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0303, filed 12/17/03, effective 7/1/04.]

**WAC 51-51-0311 Section R311—Means of egress.**

**R311.1 General.** Stairways, ramps, exterior exit balconies, hallways and doors shall comply with this section.

**EXCEPTION:** Stairs or ladders within an individual dwelling unit used for access to areas of 200 square feet (18.6 m<sup>2</sup>) or less, and not containing the primary bathroom or kitchen.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0311, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0311, filed 12/17/03, effective 7/1/04.]

**WAC 51-51-0313 Section R313—Smoke alarms.**

**R313.2 Location.** Smoke alarms shall be installed in the following locations:

1. In each sleeping room.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms.

3. On each additional story of the dwelling, including basements but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

4. In napping areas in family child day care homes.

When more than one smoke alarm is required to be installed within an individual dwelling unit, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit.

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[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0313, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0313, filed 12/17/03, effective 7/1/04.]

### **WAC 51-51-0317 Section R317—Dwelling unit separation.**

**R317.2 Townhouses.** Each townhouse shall be considered a separate building and shall be separated by fire-resistance-rated wall assemblies meeting the requirements of Section R302 for exterior walls.

**EXCEPTION:** A common 2-hour fire-resistance-rated wall is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. Penetrations of electrical outlet boxes shall be in accordance with Section R317.3.

**R317.2.1 Continuity.** The fire-resistance-rated wall or assembly separating townhouses shall be continuous from the foundation to the underside of the roof sheathing, deck or slab. The fire-resistance-rating shall extend the full length of the wall or assembly, including wall extensions through and separating attached enclosed accessory structures.

Where a story extends beyond the exterior wall of a story below:

1. The fire-resistance-rated wall or assembly shall extend to the outside edge of the upper story; or
2. The underside of the exposed floor-ceiling assembly shall be protected as required for projections in Section R302.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0317, filed 12/19/06, effective 7/1/07.]

### **WAC 51-51-0325 Section R325—Adult family homes.**

#### **SECTION R325 ADULT FAMILY HOMES**

**R325.1 General.** This section shall apply to all newly constructed adult family homes and all existing single family homes being converted to adult family homes. This section shall not apply to those adult family homes licensed by the state of Washington department of social and health services prior to July 1, 2001.

**R325.2 Submittal Standards.** In addition to those requirements in Section 106.1, the submittal shall identify the project as a Group R-3 Adult Family Home Occupancy. A floor plan shall be submitted identifying the means of egress and the components in the means of egress such as stairs, ramps, platform lifts and elevators. The plans shall indicate the rooms used for clients and the sleeping room classification of each room.

**R325.3 Sleeping Room Classification.** Each sleeping room in an adult family home shall be classified as:

1. Type S - where the means of egress contains stairs, elevators or platform lifts.
2. Type NS1 - where one means of egress is at grade level or a ramp constructed in accordance with R311.6 is provided.
3. Type NS2 - where two means of egress are at grade level or ramps constructed in accordance with R311.6 are provided.

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**R325.4 Types of Locking Devices.** All bedroom and bathroom doors shall be openable from the outside when locked.

Every closet shall be readily openable from the inside.

**R325.5 Smoke Alarm Requirements.** All adult family homes shall be equipped with smoke alarms installed as required in Section R313. Alarms shall be installed in such a manner so that the fire warning may be audible in all parts of the dwelling upon activation of a single device.

**R325.6 Escape Windows and Doors.** Every sleeping room shall be provided with emergency escape and rescue windows as required by Section R310. No alternatives to the sill height such as steps, raised platforms or other devices placed by the openings will be approved as meeting this requirement.

**R325.7 Fire Apparatus Access Roads and Water Supply for Fire Protection.** Adult family homes shall be served by fire apparatus access roads and water supplies meeting the requirements of the local jurisdiction.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0325, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0325, filed 12/17/03, effective 7/1/04.]

### **WAC 51-51-0326 Section R326—Family child day care homes.**

#### **SECTION R326 FAMILY CHILD DAY CARE HOMES**

**R326 Family Child Day Care Homes.** For family child day care homes with more than six children, each floor level used for family child day care purposes shall be served by two remote means of egress. Exterior exit doors shall be operable from the inside without the use of keys or any special knowledge or effort.

Basements located more than 4 feet below grade level shall not be used for family child day care homes unless one of following conditions exist:

1. Stairways from the basement open directly to the exterior of the building without entering the first floor; or
2. One of the two required means of egress discharges directly to the exterior from the basement level, and a self-closing door is installed at the top or bottom of the interior stair leading to the floor above; or
3. One of the two required means of egress is an operable window or door, approved for emergency escape or rescue, that opens directly to a public street, public alley, yard or exit court; or
4. A residential sprinkler system is provided throughout the entire building in accordance with National Fire Protection Association Standard 13d.

Floors located more than 4 feet above grade level shall not be occupied by children in family day care homes.

**EXCEPTIONS:**

1. Use of toilet facilities while under supervision of an adult staff person.
2. Family child day care homes may be allowed on the second story if one of the following conditions exists:
  - 2.1 Stairways from the second story open directly to the exterior of the building without entering the first floor; or
  - 2.2 One of the two required means of egress discharges directly to the exterior from the second story level, and a self-closing door is installed at the top or bottom of the interior stair leading to the floor below; or



2.3 A residential sprinkler system is provided throughout the entire building in accordance with National Fire Protection Association Standard 13d.

Every sleeping or napping room in a family child day care home shall have at least one operable window for emergency rescue.

EXCEPTION: Sleeping or napping rooms having doors leading to two separate means of egress, or a door leading directly to the exterior of the building.

Rooms or spaces containing a commercial-type cooking kitchen, boiler, maintenance shop, janitor closet, laundry, woodworking shop, flammable or combustible storage, or painting operation shall be separated from the family child day care area by at least one-hour fire-resistive construction.

EXCEPTION: A fire-resistive separation shall not be required where the food preparation kitchen contains only a domestic cooking range, and the preparation of food does not result in the production of smoke or grease laden vapors.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0326, filed 12/19/06, effective 7/1/07.]

### WAC 51-51-0327 Section R327—Protection against radon.

**R327.1 Protection Against Radon.** The radon control provisions of Appendix F of this code shall apply to buildings constructed in High Radon Potential Counties (zone 1) designated in Table AF101 (1). The radon control provisions of Appendix F of this code shall also apply to all buildings constructed using the provisions of Section R408.3 Unvented crawl space compliance method.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0327, filed 12/19/06, effective 7/1/07.]

### WAC 51-51-0403 Section R403—Footings.

**R403.1 General.** All exterior walls shall be supported on continuous solid or fully grouted masonry or concrete footings, wood foundations, or other approved structural systems which shall be of sufficient design to accommodate all loads specified in Section R301 and to transmit the resulting loads to the supporting soil within the limitations determined from the characteristics of the soil. Footings shall be supported on undisturbed natural soil or engineered fill. Foundation walls complying with Section R404 or stem walls complying with Section R403.1.3 shall be permitted to support exterior walls, exterior braced wall lines and exterior braced wall panels provided they are supported by continuous footings.

**R403.1.2 Braced Wall Panels in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>.** The braced wall panels at exterior and interior walls of buildings located in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> shall be supported by foundations.

EXCEPTIONS: 1. In buildings in Seismic Design Categories D<sub>0</sub> and D<sub>1</sub>, and in one-story buildings in Seismic Design Category D<sub>2</sub>, interior braced wall panels are not required to be supported by foundations, provided no building plan dimension perpendicular to the interior braced wall lines is greater than 50 feet.  
2. In two-story buildings in Seismic Design Category D<sub>2</sub>, interior braced wall panels are not required to be supported by foundations, provided all of the following conditions are met:  
2.1. No building plan dimension perpendicular to the interior braced wall lines exceeds 50 feet;

2.2. The distances between braced wall lines do not exceed twice the building width measured parallel to the braced wall lines;

2.3. The braced wall panels at the first story are continuously supported by floor joists, blocking or floor beams; and

2.4. The heights of braced wall panels in under-floor spaces do not exceed 48 inches (1219 mm).

**R403.1.2.1 Foundations.** Foundations at braced wall panels shall be constructed of masonry or concrete foundation walls in accordance with Sections R402 and R404, and masonry or concrete footings in accordance with Sections R402 and R403.

EXCEPTIONS: 1. In under-floor spaces, cripple walls shall be permitted to substitute for masonry or concrete foundation walls provided they comply with the following:  
a. They are located directly below the interior braced wall panels above;  
b. They are braced in accordance with Sections R602.10.2 and R602.10.11.4 for cripple wall bracing; and  
c. They are supported by footings complying with Sections R402 and R403, except that the footing of a foundation supporting an interior braced wall panel is not required to be continuous.  
2. Footings of foundations supporting interior braced wall panels are not required to be continuous but shall be constructed beyond the ends of foundation walls, stem walls and cripple walls supporting braced wall panels for a minimum distance of 4 inches and a maximum distance of the footing thickness. The footing extension is not required at intersections with other footings.

**R403.1.3 Seismic reinforcing in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>.** Concrete footings of buildings assigned to Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> shall comply with this section and have minimum reinforcement as specified by Section R403.1.3.1 or R403.1.3.2. Bottom reinforcement shall be located a minimum of 3 inches (76 mm) from the bottom of the footing.

Where a construction joint is created between a concrete footing and a concrete stem wall, minimum vertical reinforcement of one No. 4 bar shall be provided at not more than 4 feet (1219 mm) on center. The bars shall extend to 3 inches (76 mm) clear of the bottom of the footing, have a standard hook, and extend into the stem wall the lesser of 2 inches (49 mm) clear of the top of the wall and 14 inches (357 mm).

Where a solidly grouted masonry stem wall is supported on a concrete footing, minimum vertical reinforcement of one No. 4 bar shall be provided at not more than 4 feet (1219 mm) on center. The bars shall extend to 3 inches (76 mm) clear of the bottom of the footing, have a standard hook, and extend into the stem wall to 2 inches (49 mm) clear of the top of the wall.

Masonry stem walls without solid grout and vertical reinforcing are not permitted.

Concrete and masonry stem walls shall comply with the requirements of Section R404 for foundation walls.

EXCEPTION: In detached one- and two-family dwellings of light-framed construction and three stories or less above grade, plain concrete footings supporting walls, columns or pedestals are permitted.

**R403.1.3.1 Foundation stem walls.** Foundation stem walls shall have installed a minimum of one No. 4 bar within 12 inches (305 mm) of the top of the stem wall and one No. 4 bar located 3 inches (76 mm) to 4 inches (102 mm) from the bottom of the footing.

**R403.1.4 Minimum depth.** All exterior footings shall be placed at least 12 inches (305 mm) below the undisturbed ground surface. Where applicable, the depth of footings shall also comply with Sections R403.1.4.1 through R403.1.4.2.

**R403.1.4.1 Frost protection.** Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. Extend below the frost line specified in Table R301.2(1);
2. Construct in accordance with Section R403.3;
3. Construct in accordance with ASCE 32; or
4. Erect on solid rock.

**EXCEPTIONS:** 1. Protection of freestanding accessory structures with an area of 600 square feet (56 m<sup>2</sup>) or less and an eave height of 10 feet (3048 mm) or less shall not be required.  
2. Protection of freestanding accessory structures with an area of 400 square feet (37 m<sup>2</sup>) or less, of other than light-framed construction, with an eave height of 10 feet (3048 mm) or less shall not be required.  
3. Decks not supported by a dwelling need not be provided with footings that extend below the frost line.

Footings shall not bear on frozen soil unless such frozen condition is of a permanent character.

**R403.1.6 Anchorage at braced wall panels.** Where braced wall panels are supported by monolithic slabs, footings or foundations, the wood sole plates, wood sill plates or cold-formed steel bottom tracks shall be anchored to the slab cast monolithically with a footing, footing or foundation in accordance with this section.

The wood sole or sill plate shall be anchored to the monolithic slab, footing or foundation with anchor bolts spaced a maximum of 6 feet (1829 mm) on center. There shall be a minimum of two bolts per plate section with one bolt located not more than 12 inches (305 mm) and not less than seven bolt diameters from each end of the plate section. Bolts shall be at least 1/2 inch (13 mm) in diameter and shall extend a minimum of 7 inches (178 mm) into masonry or concrete. A nut and washer shall be tightened to a snug-tight condition on each bolt to the plate.

Cold-formed steel framing systems shall be fastened to wood sill plates or anchored directly to the foundation in accordance with Section R505.3.1 or R603.3.1.

**EXCEPTIONS:** 1. Foundation anchorage, spaced as required to provide equivalent anchorage to 1/2-inch-diameter (13 mm) anchor bolts.  
2. Walls 24 inches (610 mm) in total length or shorter connecting offset braced wall panels shall be anchored to the footing or foundation with a minimum of one anchor bolt located in the center third of the plate section and shall be attached to adjacent braced wall panels as specified in Figure R602.10.5 at the corners.  
3. Walls 12 inches (305 mm) in total length or shorter connecting offset braced wall panels shall be permitted to be connected to the footing or foundation without anchor bolts. The wall shall be attached to adjacent braced wall panels as specified in Figure R602.10.5 at the corners.

**R403.1.6.1 Foundation anchorage in Seismic Design Categories C, D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>.** In addition to the requirements of Section R403.1.6, the following requirements shall apply to wood light-frame structures in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> and wood light-frame townhouses in Seismic Design Category C.

(2007 Ed.)

1. Interior braced wall sill plates shall be anchored to footings or foundations with anchor bolts spaced at not more than 6 feet (1829 mm) on center and located within 12 inches (305 mm) from the ends of each plate section when supported on a continuous foundation.

2. The maximum anchor bolt spacing shall be 4 feet (1219 mm) for buildings over two stories in height.

3. Plate washers complying with Section R602.11.1 shall be provided for all anchor bolts over the full length of required braced wall lines. Properly sized cut washers shall be permitted for anchor bolts in wall lines not containing braced wall panels or in braced wall lines.

4. Stepped cripple walls shall conform to Section R602.11.3.

5. Where wood foundations in accordance with Sections R402.1 and R404.2 are used, the force transfer shall have a capacity equal to or greater than the connections required by Section R602.11.1 or the braced wall panel shall be connected to the wood foundations in accordance with the braced wall panel-to-floor fastening requirements of Table 602.3(1).

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0403, filed 12/19/06, effective 7/1/07.]

## **WAC 51-51-0404 Section R404—Foundation and retaining walls.**

**R404.1 Concrete and masonry foundation walls.** Concrete and masonry foundation walls shall be selected and constructed in accordance with the provisions of Section R404 or in accordance with ACI 318, ACI 332, NCMA TR68-A or ACI 530/ASCE 5/TMS 402 or other approved structural standards. When ACI 318, ACI 332 or ACI 530/ASCE 5/TMS 402 or the provisions of Section R404 are used to design concrete or masonry foundation walls, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for the design, unless otherwise required by the state law of the jurisdiction having authority.

Foundation walls that meet all of the following shall be considered laterally supported:

1. Full basement floor shall be 3.5 inches (89 mm) thick concrete slab poured tight against the bottom of the foundation wall.

2. Floor joists and blocking shall be connected to the sill plate at the top of the wall by the prescriptive method called out in Table R404.1(1), or; shall be connected with an approved connector with listed capacity meeting Table 404.1(1).

3. Bolt spacing for the sill plate shall be no greater than per Table R404.1(2).

4. Floor shall be blocked perpendicular to the floor joists. Blocking shall be full depth within two joist spaces of the foundation wall, and be flat-blocked with minimum 2-inch by 4-inch (51 mm by 102 mm) blocking elsewhere.

5. Where foundation walls support unbalanced load on opposite sides of the building, such as a daylight basement, the building aspect ratio, L/W, shall not exceed the value specified in Table R404.1(3). For such foundation walls, the rim board shall be attached to the sill with a 20 gage metal angle clip at 24 inches (610 mm) on center, with five 8d nails

per leg, or an approved connector supplying 230 pounds per linear foot (3.36 kN/m) capacity.

**EXCEPTION:** Foundations constructed entirely of concrete with stem walls not exceeding 5 feet (1524 mm) in height and supporting less than 4 feet (1220 mm) of unbalanced backfill are exempt from the lateral bracing requirements of Section R404.1.

**TABLE R404.1.1(3)**  
**10-INCH MASONRY FOUNDATION WALLS WITH**  
**REINFORCING**  
**WHERE  $d > 6.75$  INCHES<sup>a</sup>**  
 (no changes to Table R404.1.1(3) or footnotes)

**R404.3 Wood sill plates.** Wood sill plates shall be a minimum of 2-inch by 4-inch nominal lumber. Sill plate anchorage shall be in accordance with Sections R403.1.6 and R602.11.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0404, filed 12/19/06, effective 7/1/07.]

**WAC 51-51-0408 Section R408—Under-floor space.**

**R408.1 Ventilation.** The under-floor space between the bottom of the floor joists and the earth under any building (except space occupied by a basement) shall have ventilation openings through foundation walls or exterior walls.

**R408.2 Openings for under-floor ventilation.** The minimum net area of ventilation openings shall not be less than 1 square foot (0.0929 m<sup>2</sup>) for each 300 square feet (28 m<sup>2</sup>) of under-floor area. In addition, a ground cover that meets the requirements of Section 502.1.6.7 of the Washington State Energy Code (chapter 51-11 WAC) shall be installed. One ventilating opening shall be within 3 feet (914 mm) of each corner of the building, except one side of the building shall be permitted to have no ventilation openings. Ventilation openings shall be covered for their height and width with any of the following materials provided that the least dimension of the covering shall not exceed 1/4 inch (6.4 mm):

1. Perforated sheet metal plates not less than 0.070 inch (1.8 mm) thick.
2. Expanded sheet metal plates not less than 0.047 inch (1.2 mm) thick.
3. Cast-iron grill or grating.
4. Extruded load-bearing brick vents.
5. Hardware cloth of 0.035 inch (0.89 mm) wire or heavier.
6. Corrosion-resistant wire mesh, with the least dimension being 1/8 inch (3.2 mm).

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0408, filed 12/19/06, effective 7/1/07.]

**WAC 51-51-0602 Section R602—Wood wall framing.**

**R602.3 Design and construction.** Exterior walls of wood light-framed construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(1) and R602.3(2) or in accordance with AF&PA's NDS. Components of exterior walls shall be fastened in accordance with Table R602.3(1) through R602.3(4). Exterior walls covered with foam plastic sheathing shall be braced

in accordance with Section R602.10. Structural sheathing shall be fastened directly to structural framing members.

**R602.3.4 Bottom (sole) plate.** Studs shall have full bearing on a 2-inch nominal (38 mm) or larger plate or sill having a width at least equal to the width of the studs.

**R602.10 Wall bracing.** All exterior walls shall be braced in accordance with this section. In addition, interior braced wall lines shall be provided in accordance with Section 602.10.11. For buildings in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>, walls shall be constructed in accordance with the additional requirements of Sections R602.10.11 through R602.11.3.

**R602.10.2 Cripple wall bracing.**

**R602.10.2.1 Seismic Design Categories Other than D<sub>2</sub>.** In Seismic Design Categories other than D<sub>2</sub>, cripple walls supporting exterior walls or interior braced wall panels as required in Section R403.1.2 and R403.1.2.1 shall be braced with an amount and type of bracing as required for the wall above in accordance with Table R602.10.1 with the following modifications for cripple wall bracing:

1. The percent bracing amount as determined from Table R602.10.1 shall be increased by 15 percent; and
2. The wall panel spacing shall be decreased to 18 feet (5486 mm) instead of 25 feet (7620 mm).

**R602.10.2.2 Seismic Design Category D<sub>2</sub>.** In Seismic Design Category D<sub>2</sub>, cripple walls supporting exterior walls or interior braced wall panels as required in Section R403.1.2 and R403.1.2.1 shall be braced in accordance with Table R602.10.1.

**R602.10.2.3 Redesignation of cripple walls.** In any Seismic Design Category, cripple walls are permitted to be redesignated as the first story walls for purposes of determining wall bracing requirements. If the cripple walls are redesignated, the stories above the redesignated story shall be counted as the second and third stories, respectively.

**R602.10.5 Continuous wood structural panel sheathing.** When continuous wood structural panel sheathing is provided in accordance with Method 3 of Section R602.10.3 on all sheathable areas of all exterior walls including areas above and below openings, braced wall panel lengths are not required to be in accordance with Section R602.10.4 provided they are in accordance with Table R602.10.5. Wood structural panel sheathing shall be installed at corners in accordance with Figure R602.10.5. The bracing percentages in Table R602.10.1 for Method 3 shall be permitted to be multiplied by a factor of 0.9 for exterior walls with a maximum opening height that does not exceed 85 percent of the wall height or a factor of 0.8 for exterior walls with a maximum opening height that does not exceed 67 percent of the wall height.

**TABLE R602.10.5**  
**LENGTH REQUIREMENTS FOR BRACED WALL**  
**PANELS IN A CONTINUOUSLY SHEATHED WALL<sup>a,b</sup>**  
 (no proposed changes to contents of Table R602.10.5)

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound per square foot = 0.0479 kN/m<sup>2</sup>.

a. Linear interpolation shall be permitted.

b. Full-height sheathed wall segments on either side of garage openings that support roofs of light-framed construction only, with roof covering dead loads of 3 psf or less shall be permitted to have a 4:1 height-to-width ratio.

c. Walls on either or both sides of openings in garages attached to fully sheathed dwellings shall be permitted to be built in accordance with Section R602.10.6.2 and Figure R602.10.6.2 except that a single sill plate shall be permitted and two anchor bolts shall be placed at 1/3 points. In addition, tie-down devices shall not be required and the vertical wall segment shall have a maximum 6:1 height-to-width ratio (with height being measured from top of header to the bottom of the sill plate). This option shall be permitted for the first story of two-story applications in Seismic Design Categories A through C.

**R602.10.6 Alternate braced wall panel construction methods.** Alternate braced wall panels shall be constructed in accordance with Sections R602.10.6.1 and R602.10.6.2.

**R602.10.6.1 Alternate braced wall panels.** Alternate braced wall panels constructed in accordance with one of the following provisions shall be permitted to replace each 4 feet (1219 mm) of braced wall panel as required by Section R602.10.4. The maximum height and minimum width of each panel shall be in accordance with Table R602.10.6.

1. In one-story buildings, each panel shall be sheathed on one face with 3/8-inch-minimum-thickness (9.5 mm) wood structural panel sheathing nailed with 8d common or galvanized box nails in accordance with Table R602.3(1) and blocked at all wood structural panel sheathing edges. Two anchor bolts installed in accordance with Figure R403.1(1) shall be provided in each panel. Anchor bolts shall be placed in from each end of the panel a horizontal distance of one-fourth the panel width. Each panel end stud shall have a tie-down device fastened to the foundation, capable of providing an uplift capacity in accordance with Table R602.10.6. The tie-down device shall be installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation or on floor framing supported directly on a foundation which is continuous across the entire length of the braced wall line. This foundation shall be reinforced with not less than one No. 4 bar top and bottom. When the continuous foundation is required to have a depth greater than 12 inches (305 mm), a minimum 12-inch by 12-inch (305 mm by 305 mm) continuous footing or turned down slab edge is permitted at door openings in the braced wall line. This continuous footing or turned down slab edge shall be reinforced with not less than one No. 4 bar top and bottom. This reinforcement shall be lapped 15 inches (381 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.

2. In the first story of two-story buildings, each braced wall panel shall be in accordance with Item 1 above, except that the following:

2.1 The wood structural panel sheathing shall be provided on both faces;

2.2 Sheathing edge nailing spacing shall not exceed 4 inches on center; and

2.3 Anchor bolts shall be placed at the center of the panel width and in from each end of the panel a horizontal distance of one-fifth the panel width (three total).

**R602.10.7 Panel joints.** All vertical joints of panel sheathing shall occur over, and be fastened to, common studs. Horizontal joints in braced wall panels shall occur over, and be fastened to, common blocking of a minimum 2 inches in nominal thickness.

**EXCEPTION:** Blocking is not required behind horizontal joints in Seismic Design Categories A and B and detached dwellings in Seismic Design Category C when constructed in accordance with Section R602.10.3, braced-wall-panel construction Method 3 and Table R602.10.1, Method 3, or where permitted by the manufacturer's installation requirements for the specific sheathing material.

**R602.10.8 Connections.** Braced wall panel bottom (sole) plates shall be fastened to the floor framing and top plates shall be connected to the framing above in accordance with Table R602.3(1). Sill plates shall be fastened to the footing, foundation or slab in accordance with Sections R403.1.6 and R602.11. Where joists are perpendicular to the braced wall lines above, blocking shall be provided under and in line with the braced wall panels. Where joists are perpendicular to braced wall lines below, blocking shall be provided over and in line with the braced wall panels. Where joists are parallel to braced wall lines above or below, a rim joist or other parallel framing member shall be provided at the wall to permit fastening per Table R602.3(1). For buildings in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>, braced wall panels shall also be fastened in accordance with Section R602.11.2.

**R602.10.9 Interior braced wall support.** This section is not adopted. See Section R403.1.2.

**R602.10.10 Design of structural elements.** Where a building, or portion thereof, does not comply with one or more of the bracing requirements in Sections R602.10 through R602.10.9, those portions shall be designed and constructed in accordance with accepted engineering practice.

**R602.10.11 Bracing in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>.** Structures located in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> shall have exterior and interior braced wall lines.

**R602.10.11.1 Braced wall line spacing.** Spacing between braced wall lines in each story shall not exceed 25 feet (7620 mm) on center in both the longitudinal and transverse directions.

**EXCEPTION:** In one- and two-story buildings two adjacent braced wall lines shall not exceed 35 feet (10,363 mm) on center in order to accommodate an area not exceeding 900 square feet (84 m<sup>2</sup>) in each dwelling unit. Spacing between all other braced wall lines shall not exceed 25 feet (7620 mm).

**R602.10.11.2 Braced wall panel location.** Exterior braced wall lines shall be provided with a braced wall panel located at each end of the braced wall line.

**EXCEPTION:** For braced wall panel construction Method 3 of Section R602.10.3, the braced wall panel shall be permitted to begin no more than 8 feet (2438 mm) from each end of the braced wall line provided one of the following is satisfied:

1. A minimum 24-inch-wide (610 mm) panel is applied to each side of the building corner and the two 24-inch-wide (610 mm) panels at the corner shall be attached to framing in accordance with Figure R602.10.5; or

2. The end of each braced wall panel closest to the corner shall have a tie-down device fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below. The tie-down device

shall be capable of providing an uplift allowable design value of at least 1,800 pounds (8 kN). The tie-down device shall be installed in accordance with the manufacturer's recommendations.

**R602.10.11.3 Collectors.** A designed collector shall be provided if a braced wall panel is not located at each end of a braced wall line as indicated in Section R602.10.11.2 or, when using the Section R602.10.11.2 Exception, if a braced wall panel is more than 8 feet (2438 mm) from each end of a braced wall line.

**R602.10.11.4 Cripple wall bracing.** In addition to the requirements of Section R602.10.2, where interior braced wall panels occur without a foundation below, the length of parallel exterior cripple wall bracing shall be one and one-half times the length required by Table R602.10.1. Where cripple walls braced using Method 3 of Section R602.10.3 cannot provide this additional length, the capacity of the sheathing shall be increased by reducing the spacing of fasteners along the perimeter of each piece of sheathing to 4 inches (102 mm) on center.

**R602.10.11.5 Sheathing attachment.** Adhesive attachment of wall sheathing shall not be permitted in Seismic Design Categories C, D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>.

**R602.11 Framing and connections for Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>.** The framing and connection details of buildings located in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> shall be in accordance with Sections R602.11.1 through R602.11.3.

**R602.11.1 Wall anchorage.** Braced wall line sill plates shall be anchored to concrete or masonry foundations in accordance with Sections R403.1.6 and R602.11. For all buildings in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> and townhouses in Seismic Design Category C, plate washers, a minimum of 0.229 inch by 3 inches by 3 inches (5.8 mm by 76 mm by 76 mm) in size, shall be installed between the foundation sill plate and the nut. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (5 mm) larger than the bolt diameter and a slot length not to exceed 1-3/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut.

**R602.11.2 Interior braced wall panel connections.** Interior braced wall panels shall be fastened to floor and roof framing in accordance with Table R602.3(1), to required foundations in accordance with Section R602.11.1, and in accordance with the following requirements:

1. Floor joists parallel to the top plate shall be toe-nailed to the top plate with at least 8d nails spaced a maximum of 6 inches (152 mm) on center.
2. Top plate laps shall be face-nailed with at least eight 16d nails on each side of the splice.

**R602.11.3 Stepped foundations.** Where stepped foundations occur, the following requirements apply:

1. Where the height of a required braced wall panel that extends from foundation to floor above varies more than 4 feet (1220 mm), the braced wall panel shall be constructed in accordance with Figure R602.11.3.
2. Where the lowest floor framing rests directly on a sill bolted to a foundation not less than 8 feet (2440 mm) in

length along a line of bracing, the line shall be considered as braced. The double plate of the cripple stud wall beyond the segment of footing that extends to the lowest framed floor shall be spliced by extending the upper top plate a minimum of 4 feet (1219 mm) along the foundation. Anchor bolts shall be located a maximum of 1 foot and 3 feet (305 and 914 mm) from each end of the plate section at the step in the foundation.

3. Where cripple walls occur between the top of the foundation and the lowest floor framing, the bracing requirements for a story shall apply.

4. Where only the bottom of the foundation is stepped and the lowest floor framing rests directly on a sill bolted to the foundations, the requirements of Section R602.11.1 shall apply.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0602, filed 12/19/06, effective 7/1/07.]

## **WAC 51-51-0613 Section R613—Exterior windows and glass doors.**

**R613.4 Testing and labeling.** Exterior windows and sliding doors shall be tested by an approved independent laboratory, and bear a label identifying manufacturer, performance characteristics and approved inspection agency to indicated compliance with AAMA/WDMA/CSA 101/I.S.2/A440. Exterior side-hinged doors shall be tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 or comply with Section R613.6.

EXCEPTION:

1. Decorative glazed openings.
2. Custom exterior windows and doors manufactured by a small business shall be exempt from all testing requirements in Section R-613 of the International Residential Code provided they meet the applicable provisions of Chapter 24 of the International Building Code.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0613, filed 12/19/06, effective 7/1/07.]

## **WAC 51-51-0806 Section R806—Roof ventilation.**

**R806.4 Conditioned attic assemblies.** This section is not adopted.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0806, filed 12/19/06, effective 7/1/07.]

## **WAC 51-51-1004 Section R1004—Factory-built fireplaces.**

**R1004.1.1 Emission Standards for Factory-built Fireplaces.** After January 1, 1997, no new or used factory-built fireplace shall be installed in Washington state unless it is certified and labeled in accordance with procedures and criteria specified in the Washington State Building Code Standard 31-2.

To certify an entire fireplace model line, the internal assembly shall be tested to determine its particulate matter emission performance. Retesting and recertifying is required if the design and construction specifications of the fireplace model line internal assembly change. Testing for certification shall be performed by a Washington state department of ecology (DOE) approved and U.S. Environmental Protection Agency (EPA) accredited laboratory.

**R1004.1.2 Emission Standards for Certified Masonry and Concrete Fireplaces.** After January 1, 1997, new certified masonry or concrete fireplaces installed in Washington state shall be tested and labeled in accordance with procedures and criteria specified in the Washington State Building Code Standard 31-2.

To certify an entire fireplace model line, the internal assembly shall be tested to determine its particulate matter emission performance. Retesting and recertifying is required if the design and construction specifications of the fireplace model line internal assembly change. Testing for certification shall be performed by a Washington state department of ecology (DOE) approved and U.S. Environmental Protection Agency (EPA) accredited laboratory.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-1004, filed 12/17/03, effective 7/1/04.]

#### **WAC 51-51-1201 Section M1201—General.**

**M1201.1 Scope.** The provisions of Chapters 12 through 24 shall regulate the design, installation, maintenance, alteration and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions within buildings. These chapters shall also regulate those mechanical systems, system components, equipment and appliances specifically addressed in this code.

EXCEPTION: The standards for liquefied petroleum gas installations shall be the 2004 Edition of NFPA 58 (Liquefied Petroleum Gas Code) and the 2006 Edition of ANSI Z223.1/NFPA 54 (National Fuel Gas Code).

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-1201, filed 12/19/06, effective 7/1/07.]

**WAC 51-51-2000 Chapter 20—Boilers and water heaters.** Boilers and Unfired Pressure Vessels are regulated by chapter 70.79 RCW and chapter 296-104 WAC.

**SECTION M2001—BOILERS,** is not adopted.

**SECTION M2002—OPERATING AND SAFETY CONTROLS,** is not adopted.

**SECTION M2003—EXPANSION TANKS,** is not adopted.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-2000, filed 12/17/03, effective 7/1/04.]

**WAC 51-51-4300 Chapter 43—Referenced standards.**

#### **Washington State Building Code Standard 31-2**

##### **STANDARD TEST METHOD FOR PARTICULATE EMISSIONS FROM FIREPLACES**

**See Section R1004.1, *International Residential Code* Standard is located in *International Building Code*, Chapter 35**

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-4300, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-4300, filed 12/17/03, effective 7/1/04.]

**WAC 51-51-60101 Appendix F radon control methods.**

(2007 Ed.)

**AF101.1 General.** This appendix contains requirements for new construction in jurisdictions where radon-resistant construction is required.

Inclusion of this appendix by jurisdictions shall be required in high radon potential counties as determined in Figure AF101 and as listed in Table AF101(1).

Unvented crawl spaces are not permitted in any high radon potential county. In other areas, requirements of this appendix apply to any structure constructed with unvented crawl spaces as specified in R408.3.

[FIGURE AF101 EPA MAP OF RADON ZONES LEGEND]

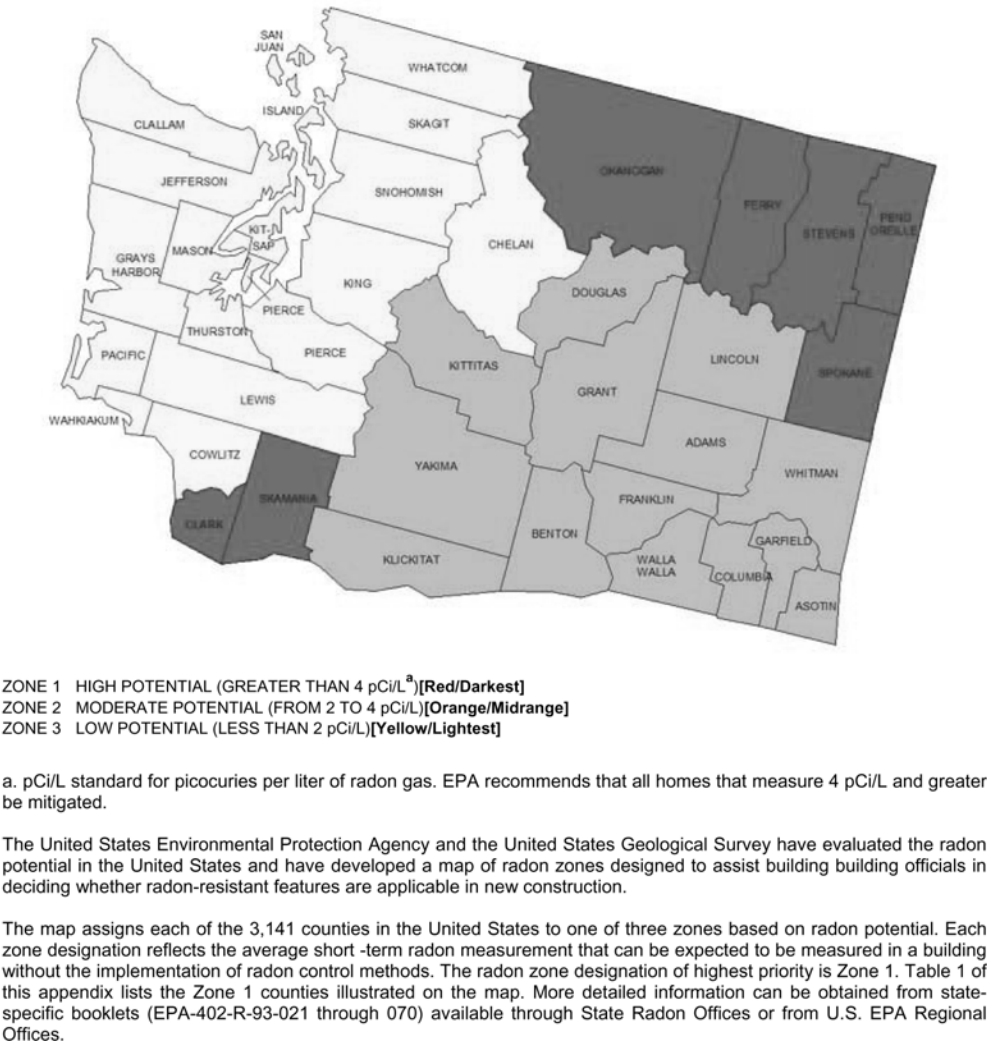


TABLE AF101(1) HIGH RADON POTENTIAL (ZONE 1) COUNTIES<sup>a</sup>

WASHINGTON: Clark, Ferry, Okanogan, Pend Oreille, Skamania, Stevens.

a. EPA recommends that this county listing be supplemented with other available state and local data to further understand the radon potential of Zone 1 areas.

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-60101, filed 12/19/06, effective 7/1/07.]

**Reviser’s note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 51-51-60103 Section AF103—Requirements.

**AF103.1 General.** The following construction techniques are intended to resist radon entry and prepare the building for post-construction radon mitigation, if necessary (see Figure AF102). These techniques are required in high radon potential counties designated in Table AF101(1).

[Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-60103, filed 12/19/06, effective 7/1/07.]

Chapter 51-52 WAC	
STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 2006 EDITION OF THE INTERNATIONAL MECHANICAL CODE	
(Formerly chapter 51-42 WAC)	
WAC	
51-52-001	Authority.
51-52-002	Purpose.
51-52-003	International Mechanical Code.
51-52-004	Conflict between International Mechanical Code and State Energy Code chapter 51-11 WAC.
51-52-005	Conflict between International Mechanical Code and State Ventilation and Indoor Air Quality Code chapter 51-13 WAC.
51-52-007	Exceptions.
51-52-008	Implementation.
51-52-0101	Section 101—General.
51-52-0202	Section 202—General definitions.
51-52-0401	Section 401—General.
51-52-0403	Section 403—Mechanical ventilation.
51-52-0501	Section 501—General.
51-52-0504	Section 504—Clothes dryer exhaust.
51-52-0506	Section 506—Commercial kitchen hood ventilation system ducts and exhaust equipment.
51-52-0601	Section 601—General.
51-52-1000	Chapter 10—Boilers, water heaters and pressure vessels.

51-52-21000	International Fuel Gas Code.
51-52-21101	Section 101—General.
51-52-22000	National Fuel Gas Code.
51-52-22006	Chapter 6—Gas piping installation.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

51-52-21404	Section 404—Piping system installation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-21404, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-092, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW.
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**WAC 51-52-001 Authority.** These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-001, filed 12/17/03, effective 7/1/04.]

**WAC 51-52-002 Purpose.** The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-002, filed 12/17/03, effective 7/1/04.]

**WAC 51-52-003 International Mechanical Code.** The 2006 edition of the *International Mechanical Code* published by the International Code Conference is hereby adopted by reference with the exceptions noted in this chapter of the Washington Administrative Code (WAC).

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-003, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-003, filed 12/17/03, effective 7/1/04.]

**WAC 51-52-004 Conflict between International Mechanical Code and State Energy Code chapter 51-11 WAC.** In the case of conflict between the duct sealing or insulation requirements of Section 603 or Section 604 of this code and the duct sealing or insulation requirements of chapter 51-11 WAC, the Washington State Energy Code, or where applicable, a local jurisdiction's energy code, the provisions of such energy codes shall govern.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-004, filed 12/17/03, effective 7/1/04.]

**WAC 51-52-005 Conflict between International Mechanical Code and State Ventilation and Indoor Air Quality Code chapter 51-13 WAC.** In the case of conflict between the Group R ventilation requirements of this code and the Group R ventilation requirements of chapter 51-13 WAC, the Washington State Ventilation and Indoor Air Quality Code, the provisions of the Ventilation and Indoor Air Quality Code shall govern.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-005, filed 12/17/03, effective 7/1/04.]

(2007 Ed.)

**WAC 51-52-007 Exceptions.** The exceptions and amendments to the International Mechanical Code contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

The provisions of this code do not apply to temporary growing structures used solely for the commercial production of horticultural plants including ornamental plants, flowers, vegetables, and fruits. "Temporary growing structure" means a structure that has the sides and roof covered with polyethylene, polyvinyl, or similar flexible synthetic material and is used to provide plants with either frost protection or increased heat retention. A temporary growing structure is not considered a building for purposes of this code.

Codes referenced which are not adopted through RCW 19.27.031 or chapter 19.27A RCW shall not apply unless specifically adopted by the authority having jurisdiction.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-007, filed 12/17/03, effective 7/1/04.]

**WAC 51-52-008 Implementation.** The International Mechanical Code adopted by chapter 51-52 WAC shall become effective in all counties and cities of this state on July 1, 2007.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-008, filed 12/17/03, effective 7/1/04.]

#### WAC 51-52-0101 Section 101—General.

**101.2 Scope.** This code shall regulate the design, installation, maintenance, alteration and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions and related processes within buildings. This code shall also regulate those mechanical systems, system components, equipment and appliances specifically addressed herein. The installation of fuel gas distribution piping and equipment, fuel gas-fired appliances and fuel gas-fired appliance venting systems shall be regulated by the *International Fuel Gas Code*.

**EXCEPTIONS:**

1. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories high with separate means of egress and their accessory structures shall comply with the *International Residential Code*.
2. The standards for liquefied petroleum gas installations shall be the 2004 Edition of NFPA 58 (Liquefied Petroleum Gas Code) and the 2006 Edition of ANSI Z223.1/NFPA 54 (National Fuel Gas Code).

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0101, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-0101, filed 12/17/03, effective 7/1/04.]

#### WAC 51-52-0202 Section 202—General definitions.

**UNUSUALLY TIGHT CONSTRUCTION.** Construction meeting the following requirements:

1. Walls exposed to the outdoor atmosphere having a continuous water vapor retarder with a rating of 1 perm (57 ng/s·m<sup>2</sup>·Pa) or less with openings gasketed or sealed; and
2. Operable windows and doors meeting the air leakage requirements of the *International Energy Conservation Code*, Section 502.1.4; and



3. Caulking or sealants are applied to areas such as joints around window and door frames, between sole plates and floors, between wall-ceiling joints, between wall panels, at penetrations for plumbing, electrical and gas lines, and at other openings; or

4. Buildings built in compliance with the 1986 or later editions of the Washington State Energy Code, chapter 51-11 WAC, Northwest Energy Code, or Super Good Cents weatherization standards or equivalent.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0202, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-0202, filed 12/17/03, effective 7/1/04.]

#### WAC 51-52-0401 Section 401—General.

**401.4.2 Exhaust openings.** Outdoor exhaust openings shall be located in accordance with Chapter 5. Exhaust air shall not be directed onto walkways.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0401, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-015, § 51-52-0401, filed 12/2/04, effective 7/1/05.]

#### WAC 51-52-0403 Section 403—Mechanical ventilation.

**403.2 Outdoor air required.** The minimum ventilation rate of outdoor air shall be determined in accordance with Section 403.3.

**EXCEPTIONS:**

1. Where the registered design professional demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor air ventilation determined in accordance with Section 403.3, the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design.
2. Alternate systems designed in accordance with ASHRAE Standard 62.1-2004 Section 6.2, Ventilation Rate Procedure, shall be permitted.

**403.2.1 Recirculation of air.** The air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.

2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where 10 percent or more of the resulting supply air-stream consists of air recirculated from these spaces.

3. Where mechanical exhaust is required by Note b in Table 403.3, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.

(Item 4 is not adopted.)

**403.3 Ventilation rate.** Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate determined in accordance with Table 403.3 based on the occupancy of the space and the occupant load or other parameter as stated therein. The occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in Table 403.3. Ventilation rates for occupancies not represented in Table 403.3 shall be determined by an approved engineering analysis. The ventilation system shall be designed to supply the required rate of ventilation air continuously during the period the building is occupied, except as otherwise stated in other provisions of the code.

**EXCEPTION:** Where occupancy density is known and documented in the plans, the outside air rate may be based on the design occupant density. Under no circumstance shall the occupancies used result in outside air less than one-half that resulting from application of Table 403.3 estimated maximum occupancy rates.

**Table 403.3**  
**Required Outdoor Ventilation Air**

Occupancy Classification	Estimated Maximum Occupant Load, Persons per 1,000 Square Feet <sup>a</sup>	Outdoor Air (Cubic feet per minute (cfm) per person) Unless Noted <sup>c</sup>
<b>Correctional facilities</b>		
Cells		
without plumbing fixtures	20	20
with plumbing fixtures <sup>s</sup>	20	20
Dining halls	100	15
Guard stations	40	15
<b>Dry cleaners, laundries</b>		
Coin-operated dry cleaner	20	15
Coin-operated laundries	20	15
Commercial dry cleaner	30	30
Commercial laundry	10	25
Storage, pick up	30	35
<b>Education</b>		
Auditoriums	150	15
Classrooms	50	15
Corridors	—	0.10 cfm/ft <sup>2</sup>
Laboratories	30	20

**Table 403.3**  
**Required Outdoor Ventilation Air**

<b>Occupancy Classification</b>	<b>Estimated Maximum Occupant Load, Persons per 1,000 Square Feet<sup>a</sup></b>	<b>Outdoor Air (Cubic feet per minute (cfm) per person) Unless Noted<sup>c</sup></b>
Libraries	20	15
Locker rooms	—	0.50 cfm/ft <sup>2</sup>
Music rooms	50	15
Smoking lounges <sup>b,g</sup>	70	60
Training shops	30	20
<b>Food and beverage service</b>		
Bars, cocktail lounges	100	30
Cafeteria, fast food	100	20
Dining rooms	70	20
Kitchens (cooking) <sup>f,g</sup>	20	15
<b>Hospitals, nursing and convalescent homes</b>		
Autopsy rooms <sup>b</sup>	—	0.50 cfm/ft <sup>2</sup>
Medical procedure rooms	20	15
Operating rooms	20	30
Patient rooms	10	25
Physical therapy	20	15
Recovery and ICU	20	15
<b>Hotels, motels, resorts and dormitories</b>		
Assembly rooms	120	15
Bathrooms <sup>g</sup>	—	35
Bedrooms	—	30 cfm per room
Conference rooms	50	20
Dormitory sleeping areas	20	15
Gambling casinos	120	30
Living rooms	—	30 cfm per room
Lobbies	30	15
<b>Offices</b>		
Conference rooms	50	20
Office spaces	7	20
Reception areas	60	15
Telecommunication centers and data entry	60	20
<b>Private dwellings, single and multiple</b>		
Garages, common for multiple units <sup>b</sup>	—	1.5 cfm/ft <sup>2</sup>
Garages, separate for each dwelling	—	100 cfm per car
Kitchens <sup>g</sup>	—	100 cfm intermittent or 25 cfm continuous
Living areas <sup>c</sup>	Based upon number of bedrooms. First bedroom: 2; each additional: 1	0.35 air changes per hour <sup>a</sup> or 15 cfm per person, whichever is greater
Toilet rooms and bathrooms <sup>g</sup>	—	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous
<b>Public spaces</b>		
Corridors and utilities	—	0.05 cfm/ft <sup>2</sup>
Elevator car <sup>g</sup>	—	1.00 cfm/ft <sup>2</sup>
Locker rooms	—	0.5 cfm/ft <sup>2</sup>
Shower rooms (per shower head) <sup>g</sup>	—	50 cfm intermittent or 20 cfm continuous
Smoking lounges <sup>b</sup>	70	60
Toilet rooms <sup>g</sup>	—	75 cfm per water closet or urinal
<b>Retail stores, sales floors and showroom floors</b>		
Basement and street	—	0.30 cfm/ft <sup>2</sup>
Dressing rooms	—	0.20 cfm/ft <sup>2</sup>
Malls and arcades	—	0.20 cfm/ft <sup>2</sup>

**Table 403.3**  
**Required Outdoor Ventilation Air**

<b>Occupancy Classification</b>	<b>Estimated Maximum Occupant Load, Persons per 1,000 Square Feet<sup>a</sup></b>	<b>Outdoor Air (Cubic feet per minute (cfm) per person) Unless Noted<sup>c</sup></b>
Shipping and receiving	—	0.15 cfm/ft <sup>2</sup>
Smoking lounges <sup>b</sup>	70	60
Storage rooms	—	0.15 cfm/ft <sup>2</sup>
Upper floors	—	0.20 cfm/ft <sup>2</sup>
Warehouses	—	0.05 cfm/ft <sup>2</sup>
<b>Specialty shops</b>		
Automotive motor-fuel-dispensing stations	—	1.5 cfm/ft <sup>2</sup>
Barber	25	15
Beauty	25	25
Clothiers, furniture	—	0.30 cfm/ft <sup>2</sup>
Embalming room <sup>b</sup>	—	2.0 cfm/ft <sup>2</sup>
Florist	8	15
Hardware, drug, fabrics	8	15
Nail salon <sup>b,i</sup>	—	50 cfm intermittent or 20 cfm continuous per station
Pet shops	—	1.00 cfm/ft <sup>2</sup>
Reducing salons	20	15
Supermarkets	8	15
<b>Sports and amusement</b>		
Ballrooms and discos	100	25
Bowling alleys (seating areas)	70	25
Game rooms	70	25
Ice arenas	—	0.50 cfm/ft <sup>2</sup>
Playing floors (gymnasiums)	30	20
Spectator areas	150	15
Swimming pools (pool and deck area)	—	0.50 cfm/ft <sup>2</sup>
<b>Storage</b>		
Repair garages, enclosed parking garage <sup>d</sup>	—	1.5 cfm/ft <sup>2</sup>
Warehouses	—	0.05 cfm/ft <sup>2</sup>
<b>Theaters</b>		
Auditoriums	150	15
Lobbies	150	20
Stages, studios	70	15
Ticket booths	60	20
<b>Transportation</b>		
Platforms	100	15
Vehicles	150	15
Waiting rooms	100	15
<b>Workrooms</b>		
Bank vaults	5	15
Darkrooms	—	0.50 cfm/ft <sup>2</sup>
Duplicating, printing	—	0.50 cfm/ft <sup>2</sup>
Meat processing <sup>c</sup>	10	15
Pharmacy	20	15
Photo studios	10	15

For SI: 1 cubic foot per minute = 0.0004719 m<sup>3</sup>/s, 1 ton = 908 kg, 1 cubic foot per minutes per square foot = 0.00508 m<sup>3</sup>/(s•m<sup>2</sup>), °C = [(°F) -32]/1.8, 1 square foot = 0.0929 m<sup>2</sup>.

- Based upon net floor area.
- Mechanical exhaust required and the recirculation of air from such spaces as permitted by Section 403.2.1 is prohibited (see Section 403.2.1, Items 1 and 3).
- Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.
- Ventilation systems in enclosed parking garages shall comply with Section 404.

- e. Where the ventilation rate is expressed in cfm/ft<sup>2</sup>, such rate is based upon cubic feet per minute per square foot of the floor area being ventilated.
- f. The sum of the outdoor and transfer air from adjacent spaces shall be sufficient to provide an exhaust rate of not less than 1.5 cfm/ft<sup>2</sup>.
- g. Transfer air permitted in accordance with Section 403.2.2.
- h. Reserved.
- i. The required exhaust system shall capture the contaminants and odors at their source.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0403, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-015, § 51-52-0403, filed 12/2/04, effective 7/1/05.]

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

## WAC 51-52-0501 Section 501—General.

**501.2 Exhaust discharge.** The air removed by every mechanical exhaust system shall be discharged outdoors at a point where it will not cause a nuisance and not less than the distances specified in Section 501.2.1. The air shall be discharged to a location from which it cannot again be readily drawn in by a ventilating system. Air shall not be exhausted into an attic or crawlspace.

**EXCEPTIONS:**

1. Whole-house cooling attic fans shall be permitted to discharge into the attic space of dwelling units having private attics.
2. Commercial cooking recirculating systems.

**501.2.1 Location of exhaust outlets.** The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

**1. For ducts conveying explosive or flammable vapors, fumes or dusts:** 30 feet (9144 mm) from the property line; 10 feet (3048 mm) from operable openings into the building; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into the building which are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.

**2. For other product-conveying outlets:** 10 feet (3048 mm) from property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into the building; 10 feet (3048 mm) above adjoining grade.

**3. For environmental air duct exhaust:** 3 feet (914 mm) from property lines, 3 feet (914 mm) from operable openings into the building for all occupancies other than Group U, and 10 feet (3048 mm) from a mechanical air intake.

**EXCEPTIONS:**

1. The separation between an air intake and exhaust outlet on a single listed package HVAC unit.
2. Exhaust from environmental air systems other than garages may be discharged into an open parking garage.
3. Except for Group I occupancies, where ventilation system design circumstances require building HVAC air to be relieved, such as during economizer operation, such air may be relieved into an open or enclosed parking garage within the same building.

**4. For specific systems:** For clothes dryer exhaust, see Section 504.4; for kitchen hoods, see Section 506.3; and for subslab soil exhaust systems, see Section 512.4.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0501, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-015, § 51-52-0501, filed 12/2/04, effective 7/1/05.]

(2007 Ed.)

## WAC 51-52-0504 Section 504—Clothes dryer exhaust.

**504.6.3 Protection required.** Plates or clips shall be placed where nails or screws from finish or other work are likely to penetrate the clothes dryer exhaust duct. Plates or clips shall be placed on the finished face of all framing members where there is less than 1-1/4 inches (32 mm) between the duct and the finished face of the framing material. The plate or clip shall be steel not less than 1/16 inch (1.59 mm) in thickness and of sufficient width to protect the duct.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0504, filed 12/19/06, effective 7/1/07.]

## WAC 51-52-0506 Section 506—Commercial kitchen hood ventilation system ducts and exhaust equipment.

**506.3.3.1 Grease duct test.** Prior to the use or concealment of any portion of a grease duct system, a leakage test shall be performed. Ducts shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the duct work from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary equipment and perform the grease duct leakage test. A light test or an approved equivalent test method shall be performed to determine that all welded and brazed joints are liquid tight. A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of duct work to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls.

A test shall be performed for the entire duct system, including the hood-to-duct connection. The duct work shall be permitted to be tested in sections, provided that every joint is tested.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0506, filed 12/19/06, effective 7/1/07.]

## WAC 51-52-0601 Section 601—General.

**601.2 Air movement in egress elements.** Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

**EXCEPTIONS:**

1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.

3. Where located within tenant spaces of one thousand square feet (93 m<sup>2</sup>) or less in area, utilization of corridors for conveying return air is permitted.
4. Where such air is part of an engineered smoke control system.
5. Make up or relief air in corridors of Group I-2 occupancies.
6. Corridors serving residential occupancies shall be permitted to be supplied without specific mechanical exhaust subject to the following:
  - 6.1 The supply air is one hundred percent outside air; and
  - 6.2 The units served by the corridor have conforming ventilation independent of the air supplied to the corridor; and
  - 6.3 For other than high-rise buildings, the supply fan will automatically shut off upon activation of corridor smoke detectors which shall be spaced at no more than thirty feet (9,144 mm) on center along the corridor; or
  - 6.4 For high-rise buildings, corridor smoke detector activation will close required smoke/fire dampers at the supply inlet to the corridor at the floor receiving the alarm.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0601, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-0601, filed 12/17/03, effective 7/1/04.]

### **WAC 51-52-1000 Chapter 10—Boilers, water heaters and pressure vessels.**

SECTIONS 1003 THROUGH 1011, are not adopted.

Boilers and Unfired Pressure Vessels are regulated by chapter 70.79 RCW and chapter 296-104 WAC, and may be further regulated by the local jurisdiction.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-1000, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-1000, filed 12/17/03, effective 7/1/04.]

### **WAC 51-52-21000 International Fuel Gas Code.**

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-21000, filed 12/17/03, effective 7/1/04.]

### **WAC 51-52-21101 Section 101—General.**

**101.2 Scope.** This code shall apply to the installation of fuel gas piping systems, fuel gas utilization equipment, gaseous hydrogen systems and regulated accessories in accordance with Section 101.2.1 through 101.2.5.

**EXCEPTIONS:**

1. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories high with separate means of egress and their accessory structures shall comply with the *International Residential Code*.
2. The standards for liquefied petroleum gas installations shall be the 2004 Edition of NFPA 58 (Liquefied Petroleum Gas Code) and the 2006 Edition of ANSI Z223.1/NFPA 54 (National Fuel Gas Code).

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-21101, filed 12/19/06, effective 7/1/07.]

### **WAC 51-52-22000 National Fuel Gas Code.**

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-22000, filed 12/17/03, effective 7/1/04.]

### **WAC 51-52-22006 Chapter 6—Gas piping installation.**

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-22006, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-22006, filed 12/17/03, effective 7/1/04.]

[Title 51 WAC—p. 194]

## **Chapter 51-54 WAC**

### **STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 2006 EDITION OF THE INTERNATIONAL FIRE CODE** (Formerly chapters 51-44 and 51-45 WAC)

#### **WAC**

51-54-001	Authority.
51-54-002	Purpose.
51-54-003	International Fire Code.
51-54-007	Exceptions.
51-54-008	Implementation.
51-54-0100	Chapter 1—Administration.
51-54-0200	Chapter 2—Definitions.
51-54-0300	Chapter 3—General precautions against fire.
51-54-0400	Chapter 4—Emergency planning and preparedness.
51-54-0500	Chapter 5—Fire service features.
51-54-0800	Chapter 8—Interior finish, decorative materials and furnishings.
51-54-0900	Chapter 9—Fire protection systems.
51-54-1000	Chapter 10—Means of egress.
51-54-1100	Aircraft-fueling vehicles.
51-54-3000	Chapter 30—Compressed gasses.
51-54-3300	Chapter 33—Explosives and fireworks.
51-54-3400	Chapter 34—Flammable and combustible liquids.
51-54-4600	Chapter 46—Marinas.

#### **DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER**

51-54-1500	Chapter 15—Flammable finishes. [Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-016, § 51-54-1500, filed 12/2/04, effective 7/1/05.] Repealed by 07-01-093, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW.
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**WAC 51-54-001 Authority.** These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-001, filed 12/17/03, effective 7/1/04.]

**WAC 51-54-002 Purpose.** The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the State Building Code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-002, filed 12/17/03, effective 7/1/04.]

**WAC 51-54-003 International Fire Code.** The 2006 edition of the International Fire Code, published by the International Code Council is hereby adopted by reference with the following additions, deletions, and exceptions.

[Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-003, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-003, filed 12/17/03, effective 7/1/04.]

**WAC 51-54-007 Exceptions.** The exceptions and amendments to the International Fire Code contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

(2007 Ed.)

Codes referenced which are not adopted through RCW 19.27.031 or chapter 19.27A RCW shall not apply unless specifically adopted by the authority having jurisdiction.

The provisions of this code do not apply to temporary growing structures used solely for the commercial production of horticultural plants including ornamental plants, flowers, vegetables, and fruits. "Temporary growing structure" means a structure that has the sides and roof covered with polyethylene, polyvinyl, or similar flexible synthetic material and is used to provide plants with either frost protection or increased heat retention. A temporary growing structure is not considered a building for purposes of this code.

The provisions of this code do not apply to the construction, alteration, or repair of temporary worker housing except as provided by rule adopted under chapter 70.114A RCW or chapter 37, Laws of 1998 (SB 6168). "Temporary worker housing" means a place, area, or piece of land where sleeping places or housing sites are provided by an employer for his or her employees or by another person, including a temporary worker housing operator, who is providing such accommodations for employees, for temporary, seasonal occupancy, and includes "labor camps" under RCW 70.54.110.

The manufacture, storage, handling, sale and use of fireworks shall be governed by chapter 70.77 RCW and by chapter 212-17 WAC and local ordinances consistent with chapter 212-17 WAC.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-007, filed 12/17/03, effective 7/1/04.]

**WAC 51-54-008 Implementation.** The International Fire Code adopted by chapter 51-54 WAC shall become effective in all counties and cities of this state on July 1, 2007.

[Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-008, filed 12/17/03, effective 7/1/04.]

## **WAC 51-54-0100 Chapter 1—Administration.**

**105.6.17 Flammable or combustible liquids.** An operational permit is required:

1. To use or operate a pipeline for the transportation within facilities of flammable or combustible liquids. This requirement shall not apply to the off-site transportation in pipelines regulated by the department of transportation (DOT) nor does it apply to piping systems.

2. To store, handle or use Class I liquids in excess of 5 gallons (19 L) in a building or in excess of 10 gallons (37.9 L) outside of a building, except that a permit is not required for the following:

- 2.1 The storage or use of Class I liquids in the fuel tank of a motor vehicle, aircraft, motorboat, mobile power plant or mobile heating plant, unless such storage, in the opinion of the code official, would cause an unsafe condition.

- 2.2 The storage or use of paints, oils, varnishes or similar flammable mixtures when such liquids are stored for maintenance, painting or similar purposes for a period of not more than 30 days.

3. To store, handle or use Class II or Class III-A liquids in excess of 25 gallons (95 L) in a building or in excess of 60

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gallons (227 L) outside a building, except for fuel oil used in connection with oil-burning equipment.

4. To remove Class I or Class II liquids from an underground storage tank used for fueling motor vehicles by any means other than the approved, stationary on-site pumps normally used for dispensing purposes.

5. To operate tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where flammable and combustible liquids are produced, processed, transported, stored, dispensed or used.

6. To place temporarily out-of-service (for more than 90 days) an underground, protected above-ground or above-ground flammable or combustible liquid tank.

7. To change the type of contents stored in a flammable or combustible liquid tank to a material which poses a greater hazard than that for which the tank was designed and constructed.

8. To manufacture, process, blend or refine flammable or combustible liquids.

9. To engage in the dispensing of liquid fuels into the fuel tanks of motor vehicles at commercial, industrial, governmental or manufacturing establishments.

10. To utilize a site for the dispensing of liquid fuels from tank vehicles into the fuel tanks of motor vehicles at commercial, industrial, governmental or manufacturing establishments.

11. To utilize a site for the dispensing of liquid fuels from tank vehicles into the fuel tanks of marine craft and special equipment at commercial, industrial, governmental or manufacturing establishments.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-0100, filed 12/17/03, effective 7/1/04.]

## **WAC 51-54-0200 Chapter 2—Definitions.**

### **SECTION 202 GENERAL DEFINITIONS.**

**ADULT FAMILY HOME** means a dwelling in which a person or persons provide personal care, special care, room and board to more than one but not more than six adults who are not related by blood or marriage to the person or persons providing the services.

**CHILD DAY CARE**, shall, for the purposes of these regulations, mean the care of children during any period of a 24-hour day.

**ELECTRICAL CODE** is the National Electrical Code, promulgated by the National Fire Protection Association, as adopted in chapter 296-46 WAC, or the locally adopted Electrical Code.

**FAMILY CHILD DAY CARE HOME** is a child day care facility, licensed by the state, located in the dwelling of the person or persons under whose direct care and supervision the child is placed, for the care of twelve or fewer children, including children who reside at the home.

**NIGHTCLUB.** An establishment, other than a theater with fixed seating, which includes all of the following:

1. Provides live entertainment by paid performing artists or by way of recorded music conducted by a person employed or engaged to do so;

2. Has as its primary source of revenue the sale of beverages of any kind for consumption on the premises and/or cover charges;

3. Has an occupant load of 100 or more as determined by the fire code official; and

4. Includes assembly space without fixed seats considered concentrated or standing space per Table 1004.1.2.

Paid performing artists are those entertainers engaged to perform in a for-profit business establishment.

**EDUCATIONAL GROUP E.** Educational Group E Occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade. Religious educational rooms and religious auditoriums, which are accessory to churches in accordance with Section 302.2 of the IBC and have occupant loads of less than 100, shall be classified as Group A-3 Occupancies.

**Day Care.** The use of a building or structure, or portion thereof, for educational, supervision or personal care services for more than five children older than 2 1/2 years of age, shall be classified as a Group E Occupancy.

**EXCEPTION:** Family child day care homes licensed by the Washington state department of social and health services for the care of twelve or fewer children shall be classified as Group R3.

**INSTITUTIONAL GROUP I.** Institutional Group I Occupancy includes, among others, the use of a building or structure, or a portion thereof, in which people, cared for or living in a supervised environment and having physical limitations because of health or age, are harbored for medical treatment or other care or treatment, or in which people are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

**Group I-1.** This occupancy shall include buildings, structures or parts thereof housing more than 16 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

- Residential board and care facilities
- Assisted living facilities
- Halfway houses
- Group homes
- Congregate care facilities
- Social rehabilitation facilities
- Alcohol and drug centers
- Convalescent facilities

A facility such as the above with five or fewer persons and adult family homes licensed by the Washington state department of social and health services shall be classified as a Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2.

A facility such as the above providing licensed care to clients in one of the categories listed in IBC Section 310.1 regulated by either the Washington department of health or the department of social and health services shall be classified as Group R-2.

**Group I-2.** This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing or custodial care on a 24-hour basis of more than five persons who are not capable of self-preservation. This group shall include, but not be limited to, the following:

Hospitals

Nursing homes (both intermediate-care facilities and skilled nursing facilities)

Mental hospitals

Detoxification facilities

A facility such as the above with five or fewer persons shall be classified as Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2.

A facility such as the above providing licensed care to clients in one of the categories listed in IBC Section 310.1 regulated by either the Washington department of health or the department of social and health services shall be classified as Group R-2.

**Group I-3.** (Remains as printed in the IFC.)

**Group I-4. Day care facilities.** This group shall include buildings and structures occupied by persons of any age who receive custodial care for less than 24 hours by individuals other than parents or guardians, relatives by blood marriage, or adoption, and in a place other than the home of the person cared for. A facility such as the above with five or fewer persons shall be classified as Group R-3 or shall comply with the *International Residential Code*. Places of worship during religious functions are not included.

**Adult care facility.** A facility that provides accommodations for less than 24 hours for more than five unrelated adults and provides supervision and personal care services shall be classified as Group I-4.

**EXCEPTION:** Where the occupants are capable of responding to an emergency situation without physical assistance from the staff, the facility shall be classified as Group A-3.

**Child care facility.** A facility that provides supervision and personal care on a less than 24-hour basis for more than five children 2 1/2 years of age or less shall be classified as Group I-4.

**EXCEPTIONS:**

1. A child day care facility that provides care for more than five but no more than 100 children 2 1/2 years or less of age, when the rooms where such children are cared for are located on the level of exit discharge and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.
2. Family child day care homes licensed by the Washington state department of social and health services for the care of 12 or fewer children shall be classified as Group R3.

**RESIDENTIAL GROUP R.** Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or Licensed Care Group LC. Residential occupancies shall include the following:

**R-1** Residential occupancies where the occupants are primarily transient in nature, including:

- Boarding houses (transient)
- Hotels (transient)
- Motels (transient)

**R-2** Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

- Apartment houses
- Boarding houses (not transient)
- Boarding homes as licensed by the department of social and health services under chapter 388-78A WAC
- Convents
- Dormitories
- Fraternities and sororities
- Hotels (nontransient)
- Motels (nontransient)
- Monasteries
- Residential treatment facilities as licensed by the department of health under chapter 246-337 WAC
- Vacation timeshare properties

**R-3** Residential occupancies where the occupants are primarily permanent in nature and not classified as R-1, R-2, R-4 or I and where buildings do not contain more than two dwelling units as applicable in Section 101.2, including adult family homes and family child day care homes for the care of 12 or fewer children, licensed by the Washington state department of social and health services, or adult and child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours. Adult family homes and family child day care homes, or adult and child care facilities that are within a single-family home are permitted to comply with the *International Residential Code* in accordance with Section 101.2.

Foster family care homes licensed by the Washington state department of social and health services shall be permitted, as an accessory use to a dwelling, for six or fewer children including those of the resident family.

R-4 classification is not adopted. Any reference in this code to R-4 does not apply.

[Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0200, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-24-071, § 51-54-0200, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-0200, filed 12/17/03, effective 7/1/04.]

### **WAC 51-54-0300 Chapter 3—General precautions against fire.**

**307.2.1 Authorization.** Where required by state or local law or regulations, open burning shall only be permitted with prior approval from the state or local air and water quality management authority, provided that all conditions specified in the authorization are followed. See also chapter 173-425 WAC.

**307.4.2 Recreational fires.** Recreational fires shall not be conducted within 25 feet of a structure or combustible material. Conditions which could cause a fire to spread within 25 feet of a structure shall be eliminated prior to ignition. See also chapter 173-425 WAC.

**308.3.1 Open-flame cooking devices.** This section is not adopted.

**308.3.1.1 Liquefied-petroleum-gas-fueled cooking devices.** This section is not adopted.

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**308.3.4 Aisles and exits.** Candles shall be prohibited in areas where occupants stand, or in an aisle or exit.

EXCEPTION: Candles used in religious ceremonies. See RCW 19.27.031(3).

**308.3.5 Religious ceremonies.** Participants in religious ceremonies shall not be precluded from carrying hand-held candles.

[Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0300, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-016, § 51-54-0300, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-0300, filed 12/17/03, effective 7/1/04.]

### **WAC 51-54-0400 Chapter 4—Emergency planning and preparedness.**

**401.2 Approval.** Where required by the fire code official, fire safety plans, emergency procedures, and employee training programs shall be approved.

**404.2 Where required.** A fire safety and evacuation plan shall be prepared and maintained in accordance with this chapter for the following occupancies and buildings when required by the fire code official.

1. Group A having an occupant load of 100 or more.
2. Group B buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
3. Group E.
4. Group H.
5. Group I.
6. Group R-1.
7. Group R-2 college and university buildings.
8. High-rise buildings.
9. Group M buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
10. Covered malls exceeding 50,000 sf in aggregate floor area.
11. Underground buildings.
12. Buildings with an atrium and having an occupancy in Group A, E, or M.

**404.4 Maintenance.** Fire safety and evacuation plans shall be reviewed by the owner or occupant annually or as necessitated by changes in staff assignments, occupancy, or the physical arrangement of the building.

**408.11.1.1 Submittal.** The lease plan shall be submitted to the fire code official, and shall be maintained on-site for immediate reference by responding fire service personnel.

**408.11.1.2 Revisions.** The lease plan shall be reviewed and revised annually or as often as necessary to keep them current. Modifications or changes in occupancies shall not be made without prior approval of the fire code official and building official.

[Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0400, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-016, § 51-54-0400, filed 12/2/04, effective 7/1/05.]



**WAC 51-54-0500 Chapter 5—Fire service features.****SECTION 503 FIRE APPARATUS ACCESS ROADS.**

**503.1 Where required.** Fire apparatus access roads shall be provided and maintained in accordance with locally adopted street, road, and access standards.

**503.1.1 Buildings and facilities,** is not adopted.

**503.1.2 Additional access,** is not adopted.

**503.1.3 High-piled storage,** is not adopted.

**503.2 Specifications.** This section is not adopted.

**503.3 Marking.** This section is not adopted.

**503.4 Obstruction of fire apparatus access roads.** This section is not adopted.

**508.3 Fire flow** requirements for buildings or portions of buildings and facilities shall be determined by an approved method.

**EXCEPTION:** Fire flow is not required for structures under 500 square feet with a B, U or R-1 occupancy where structures are at least 30 feet from any other structure and are used only for recreation.

[Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0500, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-0500, filed 12/17/03, effective 7/1/04.]

**WAC 51-54-0800 Chapter 8—Interior finish, decorative materials and furnishings.**

**801.1 Scope.** The provisions of this chapter shall govern interior finish, interior trim, furniture, furnishings, decorative materials and decorative vegetation in buildings. Sections 803 through 808 of this code shall be applicable to existing buildings. Section 803 of the International Building Code and Sections 804 through 808 of this code shall be applicable to new buildings.

**806.1.1 Restricted occupancies.** Natural cut trees shall be prohibited in Group I-1, I-2, I-3, I-4, and R-2 Occupancies providing licensed care to clients in one of the categories listed in IBC Section 310.1 regulated by either the Washington department of health or the department of social and health services.

**806.1.2 Support devices.** The support device that holds the tree in an upright position shall be of a type that is stable and that meets all of the following criteria:

1. The device shall hold the tree securely and be of adequate size to avoid tipping over of the tree.
2. The device shall be capable of containing a minimum supply of water in accordance with Table 806.1.2.
3. The water level, when full, shall cover the tree stem at least 2 inches (51 mm). The water level shall be maintained above the fresh cut and checked at least once daily.

**806.1.3 Dryness.** The tree shall be removed from the building whenever the tree needles or leaves fall off readily when a tree branch is shaken or if the needles are brittle and break when bent between the thumb and the index finger, or whenever determined necessary by the fire code official. The tree shall be checked daily for dryness.

[Title 51 WAC—p. 198]

**Table 806.1.2—Support Stand Water Capacity**

Tree Stem Diameter (inches)	Minimum Support Stand Water Capacity (gallons)	Typical Daily Water Transpiration Amount (gallons)
Up to 4	1	1/4 to 1
4 to 6	1 1/2	1 1/4 to 1 1/2
7 to 8	2	1 3/4 to 2
9 to 12	3	2 1/4 to 3
13 and over	4	Over 3

[Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0800, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-016, § 51-54-0800, filed 12/2/04, effective 7/1/05.]

**WAC 51-54-0900 Chapter 9—Fire protection systems.****902.1 Definitions.**

**PORTABLE SCHOOL CLASSROOM.** A structure, transportable in one or more sections, which requires a chassis to be transported, and is designed to be used as an educational space with or without a permanent foundation. The structure shall be trailerable and capable of being demounted and relocated to other locations as needs arise.

**903.2.1.6 Nightclub.** An automatic sprinkler system shall be provided throughout an occupancy with a nightclub. Existing nightclubs constructed prior to July 1, 2006, shall be provided with automatic sprinklers not later than December 1, 2007. The fire code official, for the application of this rule, may establish an occupant load based on the observed use of the occupancy in accordance with Table 1004.1.2.

**903.2.2 Group E.** An automatic sprinkler system shall be provided for Group E Occupancies.

**EXCEPTIONS:**

1. Portable school classrooms, provided aggregate area of any cluster or portion of a cluster of portable school classrooms does not exceed 5,000 square feet (1465 m<sup>2</sup>); and clusters of portable school classrooms shall be separated as required in Chapter 5 of the building code.
2. Group E Occupancies with an occupant load of 50 or less.

**903.2.7 Group R.** An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

**EXCEPTION:** Group R-1 if all of the following conditions apply:

1. The Group R fire area is no more than 500 square feet and is used for recreational use only.
2. The Group R fire area is on only one story.
3. The Group R fire area does not include a basement.
4. The Group R fire area is no closer than 30 feet from another structure.
5. Cooking is not allowed within the Group R fire area.
6. The Group R fire area has an occupant load of no more than 8.
7. A hand held (portable) fire extinguisher is in every Group R fire area.

**909.6.3 Elevator shaft pressurization.** Where elevator shaft pressurization is required to comply with Exception 6 of IBC Section 707.14.1, the pressurization system shall comply with and be maintained in accordance with IBC 707.14.2.

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**909.6.3.1 Activation.** The elevator shaft pressurization system shall be activated by a fire alarm system which shall include smoke detectors or other approved detectors located near the elevator shaft on each floor as approved by the building official and fire code official. If the building has a fire alarm panel, detectors shall be connected to, with power supplied by, the fire alarm panel.

**909.6.3.2 Power system.** The power source for the fire alarm system and the elevator shaft pressurization system shall be in accordance with Section 909.11.

[Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0900, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-24-071, § 51-54-0900, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-0900, filed 12/17/03, effective 7/1/04.]

## WAC 51-54-1000 Chapter 10—Means of egress.

**1008.1.2 Door swing.** Egress doors shall be side-hinged swinging.

Exceptions:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 Occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2 and R-3 as applicable in Section 101.2.
5. In other than Group H Occupancies, revolving doors complying with Section 1008.1.3.1.
6. In other than Group H Occupancies, horizontal sliding doors complying with Section 1008.1.3.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.3.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. In other than Group H Occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.

Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H Occupancy.

The opening force for interior side-swinging doors without closers shall not exceed a 5-pound (22 N) force. For other side-swinging, sliding, and folding doors, the door latch shall release when subjected to a 15-pound (67 N) force. The door shall be set in motion when subjected to a 30-pound (133 N) force. The door shall swing to a full-open position when subjected to a 15-pound (67 N) force. Forces shall be applied to the latch side.

**1009.12 Stairways in individual dwelling units.** Stairs or ladders within an individual dwelling unit used for access to areas of 200 square feet (18.6 m<sup>2</sup>) or less, and not containing the primary bathroom or kitchen, are exempt from the requirements of Section 1009.

**1014.2.2 Group I-2.** Habitable rooms or suites in Group I-2 Occupancies shall have an exit access door leading directly to a corridor.

EXCEPTION: Rooms with exit doors opening directly to the outside at ground level.

**1014.2.2.1 Definition.** For the purposes of this section, a suite is defined as a cluster of rooms or spaces sharing common circulation. Partitions within a suite are not required to

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have smoke or fire-resistance-rated construction unless required by another section of this Code.

**1014.2.3 Suites in patient sleeping areas.** Patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites if one of the following conditions is met:

1. The intervening room within the suite is not used as an exit access for more than eight patient beds.
2. The arrangement of the suite allows for direct and constant visual supervision by nursing personnel.

**1014.2.3.1 Area.** Suites of sleeping rooms shall not exceed 5,000 square feet (465 m<sup>2</sup>).

**1014.2.3.2 Exit access.** Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93 m<sup>2</sup>) shall have at least two exit access doors remotely located from each other.

**1014.2.3.3 Travel distance.** The travel distance between any point in a suite of sleeping rooms and an exit access door of that suite shall not exceed 100 feet (30,480 mm).

**1014.2.4 Suites in areas other than patient sleeping areas.** Areas other than patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites.

**1014.2.4.1 Area.** Suites of rooms, other than patient rooms, shall not exceed 10,000 square feet (929 m<sup>2</sup>).

**1014.2.4.2 Exit access.** Any rooms or suite of rooms, other than patient sleeping rooms, of more than 2,500 square feet (232 m<sup>2</sup>) shall have at least two exit access doors remotely located from each other.

**1014.2.4.3 One intervening room.** For rooms other than patient sleeping rooms, suites of rooms are permitted to have one intervening room if the travel distance within the suite is not greater than 100 feet (30,480 mm).

**1014.2.4.4 Two intervening rooms.** For rooms other than patient sleeping rooms located within a suite, exit access travel from within the suite shall be permitted through two intervening rooms where the travel distance to the exit access door is not greater than 50 feet (15,240 mm).

**1014.2.5 Travel distance.** The travel distance between any point in a Group I-2 Occupancy patient room and an exit access door in that room shall not exceed 50 feet (15,240 mm).

**1014.2.6 Separation.** Suites in Group I-2 Occupancies shall be separated from other portions of the building by a smoke partition complying with Section 710.

**1015.1 (IFC 1015.1) Exits or exit access doorways from spaces.** Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:

1. The occupant load of the space exceeds one of the values in Table 1015.1.

EXCEPTION: One means of egress is permitted within and from dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

2. The common path of egress travel exceeds one of the limitations of Section 1014.3.

3. Where required by Sections 1015.3, 1015.4, 1015.5, 1015.6 or 1015.6.1.

EXCEPTION: Group I-2 Occupancies shall comply with Section 1014.2.2.

**TABLE 1015.1 (IFC 1015.1)  
SPACES WITH ONE MEANS OF EGRESS**

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E <sup>a</sup> , F, M, U	49
H-1, H-2, H-3	3
H-4, H-5, I-1, I-3, I-4, R	10
S	29

a. Day care maximum occupant load is 10.

**1015.1.1 (IFC 1015.1.1) Three or more exits or exit access doorways.** Three exits or exit access doorways shall be provided from any space with an occupant load of 501-1,000. Four exits or exit access doorways shall be provided from any space with an occupant load greater than 1,000.

**1017.1 Construction.** Corridors shall be fire-resistance rated in accordance with Table 1017.1. The corridor walls required to be fire-resistance rated shall comply with Section 708 for fire partitions.

EXCEPTIONS: 1. A fire-resistance rating is not required for corridors in an occupancy in Group E where each room that is used for instruction has at least one door directly to the exterior and rooms for assembly purposes have at least one-half of the required means of egress doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.  
2. A fire-resistance rating is not required for corridors contained within a dwelling or sleeping unit in an occupancy in Group R.  
3. A fire-resistance rating is not required for corridors in open parking garages.  
4. A fire-resistance rating is not required for corridors in an occupancy in Group B which is a space requiring only a single means of egress complying with Section 1015.1.  
5. In Group R-2 boarding homes and residential treatment facilities licensed by Washington state, rest areas constructed as required for corridors shall be allowed to be open to the corridor provided:  
5.1 The area does not exceed 150 square feet, excluding the corridor width;  
5.2 The floor is separated into at least two compartments complying with Section 407.4;  
5.3 Combustible furnishings located within the rest area shall be in accordance with the International Fire Code, Section 805;  
5.4 Emergency means of egress lighting is provided as required by Section 1006 to illuminate the area.

**1017.6 Subdivision of building spaces—Smoke barriers.** Smoke barriers complying with Section 709 shall be installed on floors other than the level of exit discharge of a Group R-2 boarding home or residential treatment facility licensed by Washington state, where a fire-resistance rated corridor is required by Table 1017.1 The smoke barrier shall subdivide the floor into at least two compartments complying with Section 407.4.

**1019.1 (IFC 1019.1) Exits from stories.** All spaces within each story shall have access to the minimum number of exits as specified in Table 1019.1 based on the occupant load of the story, except as modified in Section 1019.2. For the purposes of this chapter, occupied roofs shall be provided with exits as

required for stories. The required number of exits from any story, including basements, shall be maintained until arrival at grade or the public way.

EXCEPTION: One means of egress is permitted within and from dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

**TABLE 1019.1 (IFC 1019.1)  
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD**

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

**1019.2 (IFC 1019.2) Buildings with one exit.** Only one exit shall be required in buildings as specified below:

1. Buildings meeting the limitations of Table 1019.2, provided the building has not more than one level below the first story above grade plane.

2. Buildings of Group R-3 Occupancy.

3. Single-level buildings with occupied spaces at the level of exit discharge provided each space complies with Section 1015.1 as a space with one exit or exit access doorway.

**TABLE 1019.2 (IFC 1019.2)  
BUILDINGS WITH ONE EXIT**

OCCUPANCY	MAXIMUM HEIGHT OF BUILDING ABOVE GRADE PLANE	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
A, B <sup>d</sup> , E <sup>c</sup> , F, M, U	1 Story	49 occupants and 75 feet travel distance
H-2, H-3	1 Story	3 occupants and 25 feet travel distance
H-4, H-5, I, R	1 Story	10 occupants and 75 feet travel distance
S <sup>a</sup>	1 Story	29 occupants and 100 feet travel distance
B <sup>b</sup> , F, M, S <sup>a</sup>	2 Stories	30 occupants and 75 feet travel distance
R-2	2 Stories <sup>c</sup>	4 dwelling units and 50 feet travel distance

For SI: 1 foot = 304.8 mm.

a. For the required number of exits for open parking structures, see Section 1019.1.1.

b. For the required number of exits for air traffic control towers, see Section 412.1.

c. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1026 shall have a maximum height of three stories above grade plane.

d. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 with an occupancy in Group B shall have a maximum travel distance of 100 feet.

e. Day care maximum occupant load is 10.

[Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-1000, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-1000, filed 12/17/03, effective 7/1/04.]

### **WAC 51-54-1100 Aircraft-fueling vehicles.**

**1106.5.1 Positioning of aircraft fuel-servicing vehicles.** Aircraft-fueling vehicles shall not be located, parked or permitted to stand in a position where such units would obstruct egress from an aircraft should a fire occur during fuel-transfer operations. Tank vehicles shall not be located, parked or permitted to stand under any portion of an aircraft except during refueling.

[Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-1100, filed 12/19/06, effective 7/1/07.]

### **WAC 51-54-3000 Chapter 30—Compressed gasses.**

**3006.1 General.** Compressed gases at hospitals and similar facilities intended for inhalation or sedation including, but not limited to, analgesia systems for dentistry, podiatry, veterinary and similar uses shall comply with this section in addition to other requirements of this chapter.

**EXCEPTION:** All distribution piping, supply manifolds, connections, regulators, valves, alarms, sensors and associated equipment shall be in accordance with the Plumbing Code.

**3006.4 Medical gas systems.** This section is not adopted.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-3000, filed 12/17/03, effective 7/1/04.]

### **WAC 51-54-3300 Chapter 33—Explosives and fireworks.**

**3301.1 Scope.** The provisions of this chapter shall govern the possession, manufacture, storage, handling, sale and use of explosives, explosive materials, and small arms ammunition. The manufacture, storage, handling, sale and use of fireworks shall be governed by chapter 70.77 RCW, and by chapter 212-12 WAC and local ordinances consistent with chapter 212-17 WAC.

**Exceptions:**

1. The Armed Forces of the United States, Coast Guard or National Guard.
2. Explosives in forms prescribed by the official United States Pharmacopoeia.
3. The possession, storage and use of small arms ammunition when packaged in accordance with DOT packaging requirements.
4. The possession, storage and use of not more than 1 pound (0.454 kg) of commercially manufactured sporting black powder, 20 pounds (9 kg) of smokeless powder and 10,000 small arms primers for hand loading of small arms ammunition for personal consumption.
5. The use of explosive materials by federal, state and local regulatory, law enforcement and fire agencies acting in their official capacities.
6. Special industrial explosive devices in which the aggregate contain less than 50 pounds (23 kg) of explosive materials.
7. The possession, storage and use of blank industrial-power load cartridges when packaged in accordance with DOT packaging regulations.
8. Transportation in accordance with DOT 49 CFR Parts 100-178.
9. Items preempted by federal regulations.

**3301.1.1 Explosive material standard.** In addition to the requirements of this chapter, NFPA 495 shall govern the manufacture, transportation, storage, sale, handling and use

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of explosive materials. See also chapter 70.74 RCW and chapter 296-52 WAC.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-3300, filed 12/17/03, effective 7/1/04.]

### **WAC 51-54-3400 Chapter 34—Flammable and combustible liquids.**

#### **3402.1 Definitions.**

**MOTOR VEHICLE.** For the purposes of this chapter, the term motor vehicle includes, but is not limited to, a vehicle, machine, tractor, trailer, or semi-trailer, or any combination thereof, propelled or drawn by mechanical power and used upon the highways in the transportation of passengers or property. The term "motor vehicle" also includes freight containers or cargo tanks used, or intended for use, in connection with motor vehicles. For reference, see 49 CFR Pt. 171.8 (October 1994).

**3404.2.7.10.1 Leaking tank disposition.** Leaking tanks shall be handled in accordance with WAC 173-360-325.

**3404.2.7.11 Tank lining.** Steel tanks are allowed to be lined only for the purpose of protecting the interior from corrosion or providing compatibility with a material to be stored. Only those liquids tested for compatibility with the lining material are allowed to be stored in lined tanks. Lining of leaking underground storage tanks shall be done in accordance with the provisions of WAC 173-360-325.

**3404.2.8.7 Arrangement.** Tanks shall be listed for above-ground use, and each tank shall be in its own vault.

**EXCEPTION:** Below-grade vaults may contain a maximum of three tanks.

Compartmentalized tanks shall be allowed and shall be considered as a single tank. Adjacent vaults shall be allowed to share a common wall. The common wall shall be liquid and vapor tight and shall be designed to withstand the load imposed when the vault on either side of the wall is filled with water.

**3404.2.11 Underground tanks.** Underground storage of flammable and combustible liquids in tanks shall comply with Section 3404.2 and Sections 3404.2.11.1 through 3404.2.11.5.2. Corrosion protection shall comply with WAC 173-360-305.

**3405.4.1 Unit with a capacity of 60 gallons or less.** Solvent distillation units used to recycle Class I, II or III-A liquids having a distillation chamber capacity of 60 gallons or less shall be listed, labeled and installed in accordance with Section 3405.4 and UL 2208.

**EXCEPTIONS:**

1. Solvent distillation units installed in dry-cleaning plants in accordance with Chapter 12.
2. Solvent distillation units used in continuous through-put industrial processes where the source of heat is remotely supplied using steam, hot water, oil or other heat transfer fluids, the temperature of which is below the autoignition point of the solvent.
3. Approved research, testing and experimental processes.

**3406.5.4 Dispensing from tank vehicles and tank cars.** Class I, II or III liquids shall be transferred from a tank vehicle or tank car only into an approved atmospheric tank or

approved portable tank, except as provided in Sections 3406.5.4.1 through 3406.5.4.5.

**3406.5.4.1 Marine craft and special equipment.** Liquids intended for use as motor fuels are allowed to be transferred from tank vehicles into the fuel tanks of marine craft and special equipment when approved by the fire code official, and when:

1. The tank vehicle's specific function is that of supplying fuel to fuel tanks.
2. The operation is not performed where the public has access or where there is unusual exposure to life and property.
3. The dispensing line does not exceed 50 feet in length.
4. The dispensing nozzle is approved.
5. Each premises is issued a separate permit in accordance with Section 105.6.17.

**3406.5.4.5 Commercial, industrial, governmental or manufacturing.** Dispensing of Class II and III motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles located at commercial, industrial, governmental or manufacturing establishments is allowed where permitted, provided such dispensing operations are conducted in accordance with the following: (Those sections not noted here remain unchanged.)

6. Mobile fueling shall not take place within 15 feet of streets, alleys, public ways, buildings, property lines, combustible storage or storm drains.

EXCEPTIONS: 1. The distance to storm drains can be eliminated if an approved storm drain cover or an approved equivalent that will prevent any fuel from reaching the drain is in place prior to fueling or home being placed within 15 feet of the drain. When placement of a storm drain cover will cause the accumulation of excessive water or difficulty in safely conducting the fueling, it shall not be used and the fueling shall not take place within 15 feet of a drain.

2. The distance to storm drains can be eliminated for drains that direct intake to approved oil-water separators.

12. Fuel delivery vehicles shall be equipped with clean-up supplies in accordance with the department of ecology's *Stormwater Management Manual for Western Washington*, Volume IV - Source Control BMP (Publication No. 99-14). Such supplies shall be readily available for employment by the operator at all times.

17. Fuel dispensing is prohibited within 25 feet of any source of ignition.

25. Operators shall place a drip pan or absorbent, in good condition, under each fuel fill opening prior to and during all dispensing operations. Drip pans shall be liquid-tight. The pan or absorbent shall have a capacity of at least 3 gallons. Spills retained in the drip pan or absorbent pillow need not be reported. Operators, when fueling, shall have on their persons an absorbent pad capable of capturing diesel foam overfills. Except during fueling, the nozzle shall face upwards and an absorbent pad shall be kept under the nozzle to prevent drips. Contaminated absorbent pads shall be disposed of regularly in accordance with local, state and federal requirements.

26. All persons and parties with an interest in the property (i.e., property owner, lessor, real estate company, property manager as well as operators of the property) must give consent in writing to allow the mobile fueling to occur on the property. Managers, lessees, renters and other persons cannot

solely give permission. Each person or party must indicate that they are under the risk of spills.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-3400, filed 12/17/03, effective 7/1/04.]

## WAC 51-54-4600 Chapter 46—Marinas.

### SECTION 4601

**4601.1 Scope.** Marina facilities shall be in accordance with this chapter.

**4601.1.1 Plans and approvals.** Plans for marina fire-protection facilities shall be approved prior to installation. The work shall be subject to final inspection and approval after installation.

**4601.1.2 Permits.** Permits are required to use open-flame devices for maintenance or repair on vessels, floats, piers or wharves.

### SECTION 4602—DEFINITIONS.

**4602.1 Definitions.** The following words and terms shall, for the purpose of this chapter and as used elsewhere in this code, have the meanings shown herein.

**COVERED BOAT MOORAGE** is a pier or system of floating or fixed access ways to which vessels on water may be secured and any portion of which are covered by a roof.

**DRAFT CURTAIN** is a structure arranged to limit the spread of smoke and heat along the underside of the ceiling or roof.

**FLOAT** is a floating structure normally used as a point of transfer for passengers and goods, or both, for mooring purposes.

**GRAVITY-OPERATED DROP OUT VENTS** are automatic smoke and heat vents containing heat-sensitive glazing designed to shrink and drop out of the vent opening when exposed to fire.

**MARINA** is any portion of the ocean or inland water, either naturally or artificially protected, for the mooring, servicing or safety of vessels and shall include artificially protected works, the public or private lands ashore, and structures or facilities provided within the enclosed body of water and ashore for the mooring or servicing of vessels or the servicing of their crews or passengers.

**PIER** is a structure built over the water, supported by pillars or piles, and used as a landing place, pleasure pavilion or similar purpose.

**VESSEL** is watercraft of any type, other than seaplanes on the water, used or capable of being used as a means of transportation. Included in this definition are nontransportation vessels such as houseboats and boathouses.

**WHARF** is a structure or bulkhead constructed of wood, stone, concrete or similar material built at the shore of a harbor, lake or river for vessels to lie alongside of, and piers or floats to be anchored to.

### SECTION 4603—GENERAL PRECAUTIONS.

**4603.1 Combustible debris.** Combustible debris and rubbish shall not be deposited or accumulated on land beneath marina structures, piers or wharves.

**4603.2 Sources of ignition.** Open-flame devices used for lighting or decoration on the exterior of a vessel, float, pier or wharf shall be approved.

**4603.3 Flammable or combustible liquid spills.** Spills of flammable or combustible liquids at or upon the water shall be reported immediately to the fire department or jurisdictional authorities.

**4603.4 Rubbish containers.** Containers with tight-fitting or self-closing lids shall be provided for the temporary storage of combustible trash or rubbish.

**4603.5 Electrical equipment.** Electrical equipment shall be installed and used in accordance with its listing and Section 605 as required for wet, damp and hazardous locations.

#### SECTION 4604—FIRE-PROTECTION EQUIPMENT.

**4604.1 General.** Marinas, piers, wharves, floats with facilities for mooring or servicing five or more vessels, and marine motor vehicle fuel-dispensing stations shall be equipped with fire-protection equipment in accordance with Section 4604.

**4604.2 Standpipes.** Marinas shall be equipped throughout with Class I manual, dry standpipe systems in accordance with NFPA 303. Systems shall be provided with outlets located such that no point on the marina pier or float system exceeds 150 feet from a standpipe outlet.

**4604.2.1 Identification of standpipe outlets.** Standpipe outlet locations shall be clearly identified by a flag or other approved means designed to be readily visible from the pier accessing the float system.

**4604.3 Access and water supply.** Piers and wharves shall be provided with fire apparatus access roads and water-supply systems with on-site fire hydrants when required and approved by the fire code official. At least one fire hydrant capable of providing the required fire flow shall be provided within an approved distance of standpipe supply connections.

**4604.4 Portable fire extinguishers.** One 4A40BC fire extinguisher shall be provided at each standpipe outlet. Additional fire extinguishers, suitable for the hazards involved, shall be provided and maintained in accordance with Section 906.

**4604.5 Communications.** A telephone not requiring a coin to operate or other approved, clearly identified means to notify the fire department shall be provided on the site in a location approved by the code official.

**4604.6 Equipment staging areas.** Space shall be provided on all float systems for the staging of emergency equipment. Staging areas shall provide a minimum of 4 feet wide by 10 feet long clear area exclusive of walkways and shall be located at each standpipe outlet. Staging areas shall be provided with barriers having a minimum height of 4" and maximum space between the bottom barrier edge and surface of the staging area of 2" on the outboard sides to prevent loss of equipment overboard. A sign reading "Fire Equipment Staging Area - Keep Clear" shall be provided at each staging area to prevent obstruction.

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**4604.7 Smoke and heat vents.** Approved automatic smoke and heat vents shall be provided in covered boat moorage areas exceeding 2,500 sq. ft. (232 m<sup>2</sup>) in area, excluding roof overhangs.

EXCEPTION: Smoke and heat vents are not required in areas protected by automatic sprinklers.

**4604.7.1 Design and installation.** Where smoke and heat vents are required they shall be installed near the roof peak, evenly distributed and arranged so that at least one vent is over each covered berth. The effective vent area shall be calculated using a ratio of one square foot of vent to every fifteen square feet of covered berth area (1:15). Each vent shall provide a minimum opening size of 4 ft. x 4 ft.

**4604.7.1.1 Smoke and heat vents.** Smoke and heat vents shall operate automatically by actuation of a heat-responsive device rated at between 100°F (56°C) above ambient.

EXCEPTION: Gravity-operated drop out vents.

**4604.7.1.2 Gravity-operated drop out vents.** Gravity-operated drop out vents shall fully open within 5 minutes after the vent cavity is exposed to a simulated fire represented by a time-temperature gradient that reaches an air temperature of 500°F (260°C) within 5 minutes.

**4604.8 Draft curtains.** Draft curtains shall be provided in covered boat moorage areas exceeding 2,500 sq. ft. (232 m<sup>2</sup>) in area, excluding roof overhangs.

EXCEPTION: Draft curtains are not required in areas protected by automatic sprinklers.

**4604.8.1 Draft curtain construction.** Draft curtains shall be constructed of sheet metal, gypsum board or other approved materials that provide equivalent performance to resist the passage of smoke. Joints and connections shall be smoke tight.

**4604.8.2 Draft curtain location and depth.** The maximum area protected by draft curtains shall not exceed 2,000 sq. ft. (186 m<sup>2</sup>) or two slips or berths, whichever is smaller. Draft curtains shall not extend past the piling line. Draft curtains shall have a minimum depth of 4 feet and shall not extend closer than 8 feet (2438 mm) to the walking surface of the pier.

#### SECTION 4605—MARINE MOTOR VEHICLE FUEL-DISPENSING STATIONS.

**4605.1 Fuel dispensing.** Marine motor vehicle fuel-dispensing stations shall be in accordance with Chapter 22.

[Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-4600, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-016, § 51-54-4600, filed 12/2/04, effective 7/1/05.]

### Chapter 51-56 WAC

### STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 2006 EDITION OF THE UNIFORM PLUMBING CODE

#### WAC

51-56-001	Authority.
51-56-002	Purpose.
51-56-003	Uniform Plumbing Code.
51-56-007	Exceptions.

51-56-008	Implementation.
51-56-0100	Chapter 1—Administration.
51-56-0200	Chapter 2—Definitions.
51-56-0300	Chapter 3—General regulations.
51-56-0400	Chapter 4—Plumbing fixtures and fixture fittings.
51-56-0500	Chapter 5—Water heaters.
51-56-0600	Chapter 6—Water supply and distribution.
51-56-0700	Chapter 7—Sanitary drainage.
51-56-0800	Chapter 8—Indirect wastes.
51-56-0900	Chapter 9—Vents.
51-56-1100	Chapter 11—Storm drainage.
51-56-1300	Chapter 13—Health care facilities and medical gas and vacuum systems.
51-56-1400	Chapter 14—Referenced standards.
51-56-1600	Chapter 16—Gray water systems.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

51-56-201300	Appendix M—Storm drainage. [Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-56-201300, filed 12/18/01, effective 7/1/02.] Repealed by 04-01-110, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27.031 and 19.27.074.
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**WAC 51-56-001 Authority.** These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-56-001, filed 12/18/01, effective 7/1/02.]

**WAC 51-56-002 Purpose.** The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes, the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-56-002, filed 12/18/01, effective 7/1/02.]

**WAC 51-56-003 Uniform Plumbing Code.** The 2006 edition of the Uniform Plumbing Code, published by the International Association of Plumbing and Mechanical Officials, is hereby adopted by reference with the following additions, deletions and exceptions: Provided that chapters 12 and 15 of this code are not adopted. Provided further, that those requirements of the Uniform Plumbing Code relating to venting and combustion air of fuel fired appliances as found in chapter 5 and those portions of the code addressing building sewers are not adopted.

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-003, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-003, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-003, filed 12/18/01, effective 7/1/02.]

**WAC 51-56-007 Exceptions.** The exceptions and amendments to the model codes contained in the provisions of chapter 19.27 RCW shall apply in cases of conflict with any of the provisions of these rules.

Codes referenced which are not adopted through RCW 19.27.031 or chapter 19.27A RCW shall not apply unless specifically adopted by the authority having jurisdiction.

[Title 51 WAC—p. 204]

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-007, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-007, filed 12/18/01, effective 7/1/02.]

**WAC 51-56-008 Implementation.** The Uniform Plumbing Code adopted by chapter 51-56 WAC shall become effective in all counties and cities of this state on July 1, 2007, unless local government residential amendments have been approved by the state building code council.

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-008, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-008, filed 12/18/01, effective 7/1/02.]

#### WAC 51-56-0100 Chapter 1—Administration.

**101.4.1.4 Conflict Between Codes.** Delete paragraph.

**102.4 Appeals.** All persons shall have the right to appeal a decision of the authority having jurisdiction. The jurisdiction shall have a board of appeals to hear and rule on Plumbing Code appeals. Members of the board shall be appointed by the jurisdiction. Decisions by the board shall be reported to the jurisdiction and administered by the authority having jurisdiction.

**103.1.3 Certification.** State rules and regulations concerning certification shall apply.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-0100, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-0100, filed 12/18/01, effective 7/1/02.]

#### WAC 51-56-0200 Chapter 2—Definitions.

**205.0 Certified Backflow Assembly Tester -** A person certified by the Washington state department of health under chapter 246-292 WAC to inspect (for correct installation and approval status) and test (for proper operation) approved backflow assemblies.

**210.0 Hot Water -** This definition is not adopted.

**218.0 Plumbing System -** Includes all potable water, building supply and distribution pipes, all plumbing fixtures and traps, all drainage and vent pipe(s), and all building drains including their respective joints and connection, devices, receptors, and appurtenances within the property lines of the premises and shall include potable water piping, potable water treating or using equipment, medical gas and medical vacuum systems, and water heaters: Provided, That no certification shall be required for the installation of a plumbing system within the property lines and outside a building.

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0200, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-0200, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-0200, filed 12/18/01, effective 7/1/02.]

#### WAC 51-56-0300 Chapter 3—General regulations.

**301.1.3 Standards.** Standards listed or referred to in this chapter or other chapters cover materials which will conform to the requirements of this code, when used in accordance with the limitations imposed in this or other chapters thereof and their listing. Where a standard covers materials of vari-

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ous grades, weights, quality, or configurations, there may be only a portion of the listed standard which is applicable. Design and materials for special conditions or materials not provided for herein are allowed to be used by special permission of the authority having jurisdiction after the authority having jurisdiction has been satisfied as to their adequacy in accordance with Section 301.2.

**311.4** Except as hereinafter provided in Sections 908.0, 909.0, 910.0, and Appendix L, Section L 6.0, 7.0 and 8.0, no vent pipe shall be used as a soil or waste pipe, nor shall any soil or waste pipe be used as a vent.

**313.6** No water, soil, or waste pipe shall be installed or permitted outside of a building or in an exterior wall unless, where necessary, adequate provision is made to protect such pipe from freezing. All hot and cold water pipes installed outside the conditioned space shall be insulated to a minimum R-3.

**313.7** All pipe penetrating floor/ceiling assemblies and fire-resistance rated walls or partitions shall be protected in accordance with the requirements of the building code.

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0300, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-0300, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-0300, filed 12/18/01, effective 7/1/02.]

## **WAC 51-56-0400 Chapter 4—Plumbing fixtures and fixture fittings.**

### **402.0 Water-Conserving Fixtures and Fittings.**

**402.1** The purpose of this section shall be to implement water conservation performance standards in accordance with RCW 19.27.170.

**402.2 Application.** This section shall apply to all new construction and all remodeling involving replacement of plumbing fixtures and fittings in all residential, hotel, motel, school, industrial, commercial use, or other occupancies determined by the council to use significant quantities of water. Plumbing fixtures, fittings and appurtenances shall conform to the standards specified in this section and shall be provided with an adequate supply of potable water to flush and keep the fixtures in a clean and sanitary condition without danger of backflow or cross-connection.

### **402.3 Water Efficiency Standards.**

#### **402.3.1 Standards for Vitreous China Plumbing Fixtures.**

**402.3.1.1** The following standards shall be adopted as plumbing materials, performance standards, and labeling standards for water closets and urinals. Water closets and urinals shall meet either the ANSI/ASME standards or the CSA standard.

ANSI/ASME A112.19.2M-1998	Vitreous China Plumbing Fixtures
ANSI/ASME A112.19.6-1995	Hydraulic Requirements for Water Closets and Urinals
CSA B45	CSA Standards on Plumbing Fixtures

**402.3.1.2** The maximum water use allowed in gallons per flush (gpf) or liters per flush (lpf) for any of the following water closets shall be the following:

Tank-type toilets	1.6 gpf/6.0 lpf
Flushometer-valve toilets	1.6 gpf/6.0 lpf
Flushometer-tank toilets	1.6 gpf/6.0 lpf
Electromechanical hydraulic toilets	1.6 gpf/6.0 lpf

**EXCEPTIONS:**

1. Water closets located in day care centers, intended for use by young children may have a maximum water use of 3.5 gallons per flush or 13.25 liters per flush.
2. Water closets with bed pan washers may have a maximum water use of 3.5 gallons per flush or 13.25 liters per flush.
3. Blow out bowls, as defined in ANSI/ASME A112.19.2M, Section 5.1.2.3 may have a maximum water use of 3.5 gallons per flush or 13.25 liters per flush.

**402.3.1.3** The maximum water use allowed for any urinal shall be 1.0 gallons per flush or 3.78 liters per flush.

**402.3.1.4** No urinal or water closet that operates on a continuous flow or continuous flush basis shall be permitted.

**402.3.1.5** This section does not apply to fixtures installed before the effective date of this Section, that are removed and relocated to another room or area of the same building after the effective date of this Section.

#### **402.3.2 Standards for Plumbing Fixture Fittings.**

**402.3.2.1** The following standards are adopted as plumbing material, performance requirements, and labeling standards for plumbing fixture fittings. Faucets, aerators, and shower heads shall meet either the ANSI/ASME standard or the CSA standard.

ANSI/ASME A112.18.1M-1996	Plumbing Fixture Fittings
CSA B125	Plumbing Fittings

**402.3.2.2** The maximum water use allowed for any shower head is 2.5 gallons per minute or 9.5 liters per minute.

**EXCEPTION:** Emergency use showers shall be exempt from the maximum water usage rates.

**402.3.2.3** The maximum water use allowed in gallons per minute (gpm) or liters per minute (lpm) for any of the following faucets and replacement aerators is the following:

Lavatory faucets	2.5 gpm/9.5 lpm
Kitchen faucets	2.5 gpm/9.5 lpm
Replacement aerators	2.5 gpm/9.5 lpm
Public lavatory faucets other than metering	0.5 gpm/1.9 lpm

**402.4 Metering Valves.** Lavatory faucets located in restrooms intended for use by the general public shall be equipped with a metering valve designed to close by spring or water pressure when left unattended (self-closing).

**EXCEPTIONS:**

1. Where designed and installed for use by persons with a disability.
2. Where installed in day care centers, for use primarily by children under 6 years of age.

#### **402.5 Implementation.**

**402.5.1** The standards for water efficiency and labeling contained within Section 402.3 shall be in effect as of July 1,



1993, as provided in RCW 19.27.170 and amended July 1, 1998.

**402.5.2** No individual, public or private corporation, firm, political subdivision, government agency, or other legal entity, may, for purposes of use in the state of Washington, distribute, sell, offer for sale, import, install, or approve for installation any plumbing fixtures or fittings unless the fixtures or fittings meet the standards as provided for in this Section.

Section 402.6 is not adopted.

**411.2 Location of Floor Drains.** Floor drains shall be installed in the following areas:

**411.2.1** Toilet rooms containing two (2) or more water closets or a combination of one (1) water closet and one (1) urinal, except in a dwelling unit. The floor shall slope toward the floor drains.

**411.2.2** Laundry rooms in commercial buildings and common laundry facilities in multifamily dwelling buildings.

**412.0 Minimum Number of Required Fixtures.** For minimum number of plumbing fixtures required, see Building Code chapter 29 and Table 2902.1.

Sections 412.1 through 412.7 and Table 4-1 are not adopted.

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0400, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-0400, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-0400, filed 12/18/01, effective 7/1/02.]

## WAC 51-56-0500 Chapter 5—Water heaters.

**501.0 General.** The regulations of this chapter shall govern the construction, location, and installation of fuel burning and other water heaters heating potable water. The minimum capacity for water heaters shall be in accordance with the first hour rating listed in Table 5-1. See the Mechanical Code for combustion air and installation of all vents and their connectors. All design, construction, and workmanship shall be in conformity with accepted engineering practices, manufacturer's installation instructions, and applicable standards and shall be of such character as to secure the results sought to be obtained by this Code. No water heater shall be hereinafter installed which does not comply in all respects with the type and model of each size thereof approved by the authority having jurisdiction. A list of accepted gas equipment standards is included in Table 14-1.

TABLE 5-1<sup>1,3</sup>

Number of Bathrooms	1 to 1.5			2 to 2.5				3 to 3.5			
Number of Bedrooms	1	2	3	2	3	4	5	3	4	5	6
First Hour Rating <sup>2</sup> , Gallons	42	54	54	54	67	67	80	67	80	80	80

Notes: <sup>1</sup>The first hour rating is found on the "Energy Guide" label.

<sup>2</sup>Nonstorage and solar water heaters shall be sized to meet the appropriate first hour rating as shown in the table.

<sup>3</sup>For replacement water heaters, see Section 101.4.1.1.1.

**502.2 Chimney** – Delete definition.

**502.3 Chimney, Factory-Built** – Delete definition.

**502.4 Chimney, Masonry** – Delete definition.

**502.5 Chimney, Metal** – Delete definition.

**502.7 Direct Vent Appliance** – Delete definition.

**502.8 Flue Collar** – Delete definition.

**502.9 Gas Vent, Type B** – Delete definition.

**502.10 Gas Vent, Type L** – Delete definition.

**502.12 Vent** – Delete definition.

**502.13 Vent Connector** – Delete definition.

**502.14 Venting System** – Delete definition.

**504.1 Inspection of Chimneys or Vents.** Delete paragraph.

**505.1 Location.** Water heater installation in bedrooms and bathrooms shall comply with one of the following:

(1) Fuel-burning water heaters may be installed in a closet located in the bedroom or bathroom provided the closet is equipped with a listed, gasketed door assembly and a listed self-closing device. The self-closing door assembly shall meet the requirements of Section 505.1.1. The door assembly shall be installed with a threshold and bottom door seal and shall meet the requirements of Section 505.1.2. All

combustion air for such installations shall be obtained from the outdoors in accordance with the International Mechanical Code. The closet shall be for the exclusive use of the water heater.

(2) Water heater shall be of the direct vent type.

**506.2** All storage-type water heaters deriving heat from fuels or types of energy other than gas, shall be provided with, in addition to the primary temperature controls, an over-temperature safety protection device constructed, listed, and installed in accordance with nationally recognized applicable standards for such devices and a combination temperature and pressure relief valve.

**507.0 Combustion Air.** For issues relating to combustion air, see the Mechanical Code.

Sections 507.1 through 507.10 are not adopted.

Sections 508.6 through 508.9 are not adopted.

508.12 Delete entire section.

508.18 Venting of Flue Gases - Delete entire section.

Sections 508.20 through 508.24.5 are not adopted.

**510.0 Venting of Equipment.** Delete entire section.

**511.0 Sizing of Category I Venting Systems.** Delete entire section.

**512.0 Direct Vent Equipment.** Delete entire section.

Chapter 5, Part II is not adopted.

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0500, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-0500, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-0500, filed 12/18/01, effective 7/1/02.]

**WAC 51-56-0600 Chapter 6—Water supply and distribution.**

**603.0 Cross-Connection Control.** Cross-connection control shall be provided in accordance with the provisions of this chapter. Devices or assemblies for protection of the public water system must be models approved by the department of health under WAC 246-290-490. The authority having jurisdiction shall coordinate with the local water purveyor where applicable in all matters concerning cross-connection control within the property lines of the premises.

No person shall install any water operated equipment or mechanism, or use any water treating chemical or substance, if it is found that such equipment, mechanism, chemical or substance may cause pollution or contamination of the domestic water supply. Such equipment or mechanism may be permitted only when equipped with an approved backflow prevention device or assembly.

**603.1 Approval of Devices or Assemblies.** Before any device or assembly is installed for the prevention of backflow, it shall have first been approved by the authority having jurisdiction. Devices or assemblies shall be tested for conformity with recognized standards or other standards acceptable to the authority having jurisdiction that are consistent with the intent of this code.

All devices or assemblies installed in a potable water supply system for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices or assemblies. Such devices or assemblies shall be tested in accordance with Section 603.3.3 and WAC 246-290-490. If found to be defective or inoperative, the device or assembly shall be replaced or repaired. No device or assembly shall be removed from use or relocated or other device or assembly substituted, without the approval of the authority having jurisdiction.

Testing shall be performed by a Washington state department of health certified backflow assembly tester.

**603.3.3** For devices and assemblies other than those regulated by the Washington department of health in conjunction with the local water purveyor for the protection of public water systems, the authority having jurisdiction shall ensure that the premise owner or responsible person shall have the backflow prevention assembly tested by a Washington state department of health certified backflow assembly tester:

- (1) At the time of installation, repair or relocation; and
- (2) At least on an annual schedule thereafter, unless more frequent testing is required by the authority having jurisdiction.

**603.4.6.1** Potable water supplies to systems having no pumps or connections for pumping equipment, and no chemical

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injection or provisions for chemical injection, shall be protected from backflow by one of the following devices:

- (1) Atmospheric vacuum breaker.
- (2) Pressure vacuum breaker.
- (3) Spill-resistant pressure vacuum breaker.
- (4) Reduced pressure backflow preventer.
- (5) A double check valve may be allowed when approved by the water purveyor and the authority having jurisdiction.

**603.4.10 Potable Water Make Up Connections to Steam or Hot Water Boilers** shall be protected by an air gap or a reduced pressure principle backflow preventer.

**603.4.12 Potable Water Supply to Carbonators** shall be protected by a listed reduced pressure principle backflow preventer as approved by the authority having jurisdiction for the specific use.

**603.4.14** Backflow preventers shall not be located in any area containing fumes or aerosols that are toxic, poisonous, infectious, or corrosive.

**603.4.16.1** Except as provided under Sections 603.4.16.2 and 603.4.16.3, potable water supplies to fire protection systems that are normally under pressure, including but not limited to standpipes and automatic sprinkler systems, except in one or two family residential flow-through or combination sprinkler systems piped in materials approved for potable water distribution systems, shall be protected from back-pressure and back-siphonage by one of the following testable devices:

1. Double check valve assembly.
2. Double check detector assembly.
3. Reduced pressure backflow preventer.
4. Reduced pressure detector assembly.

Potable water supplies to fire protection systems that are not normally under pressure shall be protected from backflow and shall meet the requirements of the appropriate standard(s) referenced in Table 14-1.

**603.4.23 Potable Water Supply to Swimming Pools, Spas and Hot Tubs** shall be protected by an airgap or a reduced pressure principle backflow preventer when:

- (1) The unit is equipped with a submerged fill line; or
- (2) The potable water supply is directly connected to the unit circulation system.

**604.15** Plastic water service piping may terminate within a building, provided the connection to the potable water distribution system shall be made as near as is practical to the point of entry and shall be accessible. Barbed insert fittings with hose clamps are prohibited as a transition fitting within the building.

**608.5** Relief valves located inside a building shall be provided with a drain, not smaller than the relief valve outlet, of galvanized steel, hard drawn copper piping and fittings, CPVC, or listed relief valve drain tube with fittings which will not reduce the internal bore of the pipe or tubing (straight lengths as opposed to coils) and shall extend from the valve to the outside of the building with the end of the pipe not more than two (2) feet (610 mm) nor less than six (6) inches (152 mm) above the ground or the flood level of the area

receiving the discharge and pointing downward. Such drains may terminate at other approved locations. No part of such drain pipe shall be trapped or subject to freezing. The terminal end of the drain pipe shall not be threaded.

**EXCEPTION:** Replacement water heating equipment shall only be required to provide a drain pointing downward from the relief valve to extend between two feet (610 mm) and six inches (152 mm) from the floor. No additional floor drain need be provided.

**610.4** Systems within the range of Table 6-5 may be sized from that table or by the method set forth in Section 610.5.

Listed parallel water distribution systems shall be installed in accordance with their listing.

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0600, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-0600, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-0600, filed 12/18/01, effective 7/1/02.]

### WAC 51-56-0700 Chapter 7—Sanitary drainage.

**701.1.2** ABS and PVC DWV piping installations shall be installed in accordance with IS 5 and IS 9. Except for individual single family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke developed index of not more than 50, when tested in accordance with the Test for Surface-Burning Characteristics of the Building Materials (See the Building Code standards based on ASTM E-84 and ANSI/UL 723).

**704.3** Except where specifically required to be connected indirectly to the drainage system, or when first approved by the authority having jurisdiction, all plumbing fixtures, drains, appurtenances, and appliances shall be directly connected to the drainage system of the building or premises.

**710.3** The minimum size of any pump or any discharge pipe from a sump having a water closet connected thereto shall be not less than two (2) inches (52 mm).

Sections 710.3.1 through 710.3.3 are not adopted.

### CHAPTER 7, PART II—BUILDING SEWERS

**Part II Building Sewers.** Delete all of Part II (Sections 713 through 723, and Tables 7-7 and 7-8).

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0700, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-56-0700, filed 12/18/01, effective 7/1/02.]

### WAC 51-56-0800 Chapter 8—Indirect wastes.

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0800, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-56-0800, filed 12/18/01, effective 7/1/02.]

### WAC 51-56-0900 Chapter 9—Vents.

**903.1.2** ABS and PVC DWV piping installations shall be installed in accordance with IS 5 and IS 9. Except for individual single family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke developed index of not more than 50, when tested in accordance with the Test for Surface-Burning

Characteristics of the Building Materials (see the Building Code standards based on ASTM E-84 and ANSI/UL 723).

**908.4.1 Where Permitted.** Any combination of fixtures within one (1) or two (2) bathrooms located on the same floor level and serving dwelling units or sleeping units shall be permitted to be vented by a wet vent. The wet vent shall be considered the vent for the fixtures and shall extend from the connection of the dry vent along the direction of the flow in the drain pipe to the most downstream fixture drain connection to the horizontal branch drain. Only the fixtures within the bathroom(s) shall connect to the wet-vented horizontal branch drain. Any additional fixtures shall discharge downstream of the wet vent system and be conventionally vented.

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0900, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-56-0900, filed 12/18/01, effective 7/1/02.]

### WAC 51-56-1100 Chapter 11—Storm drainage.

**1101.3 Material Uses.** Rainwater piping placed within the interior of a building or run within a vent or shaft shall be of cast iron, galvanized steel, wrought iron, brass, copper, lead, Schedule 40 ABS DWV, Schedule 40 PVC DWV, or other approved materials, and changes in direction shall conform to the requirements of Section 706.0. ABS and PVC DWV piping installations shall be installed in accordance with IS 5 and IS 9. Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke-developed index of not more than 50, when tested in accordance with the Test for Surface-Burning Characteristics of the Building Materials (see the Building Code standards based on ASTM E-84 and ANSI/UL 723).

#### 1101.12.0 Cleanouts.

**1101.12.1** Cleanouts for building storm drains shall comply with the requirements of this section. Rain leaders and conductors connected to a building storm sewer shall have a cleanout installed at the base of the outside leader or outside conductor before it connects to the horizontal drain. Cleanouts shall be placed inside the building near the connection between the building drain and the building sewer or installed outside the building at the lower end of the building drain and extended to grade.

**1101.12.2** Each cleanout shall be installed so that it opens to allow cleaning in the direction of flow of the soil or waste or at right angles thereto, and except in the case of wye branch and end-of-line cleanouts, shall be installed vertically above the flow line of the pipe.

**1101.12.3** Cleanouts installed under concrete or asphalt paving shall be made accessible by yard boxes, or extending flush with paving with approved materials and be adequately protected.

**1101.12.4** Approved manholes may be installed in lieu of cleanouts when first approved by the authority having jurisdiction. The maximum distance between manholes shall not exceed three hundred (300) feet (91.4 m).

The inlet and outlet connections shall be made by the use of a flexible compression joint no closer than twelve (12) inches (305 mm) to, and not farther than three (3) feet (914 mm) from the manhole. No flexible compression joints shall be embedded in the manhole base.

**1108.0 Controlled-Flow Roof Drainage.** This section is not adopted.

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-1100, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-1100, filed 12/17/03, effective 7/1/04.]

## **WAC 51-56-1300 Chapter 13—Health care facilities and medical gas and vacuum systems.**

### **Part II Medical Gas and Vacuum Systems**

#### **1309.0 Scope.**

**1309.1** The provisions herein shall apply to the design, installation, testing, and verification of medical gas, medical vacuum systems, and related permanent equipment in hospitals, clinics, and other health care facilities.

**1309.2** The purpose of this chapter is to provide minimum requirements for the design, installation, testing and verification of medical gas, medical vacuum systems, and related permanent equipment, from the central supply system to the station outlets or inlets.

**1313.3 Minimum Station Outlets/Inlets.** Station outlets and inlets for medical gas and medical vacuum systems shall be provided as listed in chapter 246-320 WAC.

#### **1328.0 System Verification.**

**1328.1** Prior to any medical gas system being placed in service, each and every system shall be verified as described in section 1328.2.

**1328.1.1** Verification tests shall be performed only after all tests required in section 1327.0, Installer Performed Tests, have been completed.

Testing shall be conducted by a party technically competent and experienced in the field of medical gas and vacuum pipeline testing and meeting the requirements of ANSI/ASSE Standard 6030, Medical Gas Verifiers Professional Qualifications Standard.

Testing shall be performed by a party other than the installing contractor or material vendor.

When systems have been installed by in-house personnel, testing shall be permitted by personnel of that organization who meet the requirements of this section.

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-1300, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-1300, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-1300, filed 12/18/01, effective 7/1/02.]

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## **WAC 51-56-1400 Chapter 14—Referenced standards.**

**TABLE 14-1**

### **Standards for Materials, Equipment, Joints and Connections**

Where more than one standard has been listed for the same material or method, the relevant portions of all such standards shall apply.

Add the following standard to those listed in Table 14-1:

Standard Number	Standard Title	Application
NFPA 99-2005	Health Care Facilities	Piping
NFPA 99C-2005	Gas and Vacuum Systems	Piping
WAC 246-290-490	Washington State Department of Health Cross-connection Control Requirements	Backflow Protection

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-1400, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-1400, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-1400, filed 12/18/01, effective 7/1/02.]

## **WAC 51-56-1600 Chapter 16—Gray water systems.**

### **Part I, Gray Water Systems, is not adopted.**

[Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-1600, filed 12/19/06, effective 7/1/07.]

## **Chapter 51-57 WAC**

### **STATE BUILDING CODE ADOPTION AND AMENDMENT OF APPENDIX A, B AND APPENDIX I OF THE 2003 EDITION OF THE UNIFORM PLUMBING CODE**

#### **WAC**

51-57-001	Authority.
51-57-002	Purpose.
51-57-003	Uniform Plumbing Code standards.
51-57-007	Exceptions.
51-57-008	Implementation.
51-57-202000	Installation standard 20-200—CPVC solvent cemented hot and cold water distribution systems.
51-57-790000	Installation Standard 7-90—Polyethylene cold water building supply and yard piping.
51-57-895000	Installation Standard 8-95—PVC cold water building supply and yard piping.

**WAC 51-57-001 Authority.** These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-57-001, filed 12/18/01, effective 7/1/02.]

**WAC 51-57-002 Purpose.** The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes, the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information.

mation, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-57-002, filed 12/18/01, effective 7/1/02.]

#### **WAC 51-57-003 Uniform Plumbing Code Standards.**

The 2003 edition of the Uniform Plumbing Code Standards (Appendixes A, B and I), published by the International Association of Plumbing and Mechanical Officials are hereby adopted by reference.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-57-003, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-57-003, filed 12/18/01, effective 7/1/02.]

**WAC 51-57-007 Exceptions.** The exceptions and amendments to the Uniform Codes contained in the provisions of chapter 19.27 RCW shall apply in cases of conflict with any of the provisions of these rules.

[Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-57-007, filed 12/18/01, effective 7/1/02.]

**WAC 51-57-008 Implementation.** The Uniform Plumbing Code Standards adopted by chapter 19.27 RCW shall become effective in all counties and cities of this state on July 1, 2004, unless local government residential amendments have been approved by the state building code council.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-57-008, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-57-008, filed 12/18/01, effective 7/1/02.]

#### **WAC 51-57-202000 Installation standard 20-200—CPVC solvent cemented hot and cold water distribution systems.**

**301.1.1 Materials.** Materials shall comply with the following:

<b>Materials</b>	<b>ASTM Std</b>
Raw Material - CPVC 23447-B	D1784-95
IPS pipe Sch 40 (1/2 in., 3/4 in., and 1 in.)	F 441-89 <sup>e1</sup>
Sch 80 (1/2 in. - 2 in.)	F 441-94
Tubing SDR 11 (1/2 in. - 2 in.)	D2846-93
Fittings Sch 40 (1/2 in., 3/4 in., and 1 in.) Sch 80 (1/2 in. - 2 in.) Tube Fittings (1/2 in. - 2 in.)	F 438-93 F 439-93a D2846-93

**Primer.** Listed primers shall be used that are compatible with the type of listed CPVC cement and pipe used. The primer shall be a true solvent for CPVC, containing no slow-drying ingredient. Cleaners shall not be allowed to be used as a substitute or equivalent for a listed primer.

**EXCEPTION:** Listed solvent cements that do not require the use of primer shall be permitted for use with CPVC pipe and fittings, manufactured in accordance with ASTM D2845 (1/2 in. - 2 in.).

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-57-202000, filed 12/17/03, effective 7/1/04.]

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#### **WAC 51-57-790000 Installation Standard 7-90—Polyethylene cold water building supply and yard piping.**

**604.1 Location.** Polyethylene piping may terminate within a building or structure. The connection to the potable water distribution system shall be accessible, except that it may be buried underground outside of the building or structure in an accessible location. Barbed insert fittings with hose clamps are prohibited within a building.

[Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-57-790000, filed 12/18/01, effective 7/1/02.]

#### **WAC 51-57-895000 Installation Standard 8-95—PVC cold water building supply and yard piping.**

**604.1 Location.** PVC piping may terminate within a building or structure. The connection to the potable water distribution system shall be accessible, except that it may be buried underground outside of the building or structure in an accessible location.

[Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-57-895000, filed 12/18/01, effective 7/1/02.]